

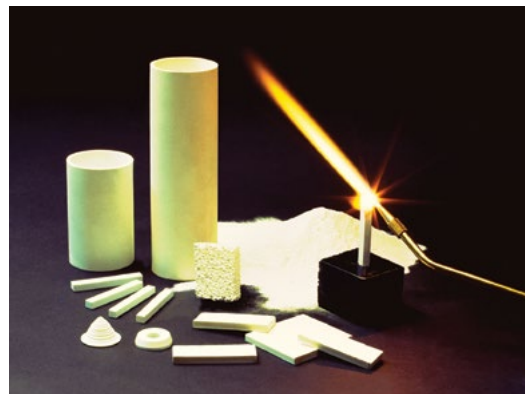
Since 1965, our success has been a result of this simple business strategy:

- Understanding Customer Requirements.
- Providing Outstanding Service and Support.
- Producing High Quality Technical Materials and Equipment.
- Solving Difficult Technical Problems.

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Aremco's advanced material division is a leader in the development and production of technical ceramics, adhesives, coatings, sealants and potting compounds for applications to 3200 °F. These materials are used throughout industry in the design of sensors, electrical components and analytical instruments. Industries served include automotive, aerospace, chemical processing, metallurgical, power generation and semiconductor.



Aremco offers a wide range of full-fired and machinable ceramics for applications in the aerospace, automotive, electrical, heat-treating, metallurgical, semiconductor industries, and more.

CERAMIC GRADES

Machinables

| | |
|-------------|-----------------------------------|
| 502-600 | Mica Glass-Ceramic |
| 502-800 | Macor Glass-Ceramics |
| 502-900 | Calcium Silicate |
| 502-1100-UF | Aluminum-Silicate, Un-Fired |
| 502-1400-BF | Aluminum Oxide, Bisque-Fired, 96% |
| 502-1600 | Boron Nitride, 99% |

Full-Fired, Dense

| | |
|---------------|---------------------------------------|
| 502-676 | Magnesium Oxide, 99.4% |
| 502-1100-FF | Aluminum-Silicate, Full-Fired |
| 502-1400-96 | Aluminum Oxide, 96% |
| 502-1400-998 | Aluminum Oxide, 99.8% |
| 502-1900-MSZ | Zirconium Oxide, Magnesium Stabilized |
| 502-1900-YTZP | Zirconium Oxide, Yttria Stabilized |

BN Composites

| | |
|----------|--------------------------------|
| 502-1810 | Boron Nitride-Aluminum Oxide |
| 502-1820 | Boron Nitride-Aluminum Nitride |
| 502-1830 | Boron Nitride-Zirconium Oxide |

Additional ceramics including Silicon Carbide and Silicon Nitride and custom ceramic formulations are available upon request. Comprehensive precision production services include isostatic pressing, injection molding, and diamond and laser machining.

TYPICAL APPLICATIONS

Aerospace

Gas Nozzles, Thermal Insulators, Space Mirrors, and Nose Cones.

Automotive

Diesel Port Liners, Manifold Insulation, Catalyst Support Systems, Flow Separator Housings, Regenerator Cores, Turbine Nozzles.

Electrical

Connector Housings, Heater And Resistor Supports, Washers, Inserts & Stand-Offs, Instrument and Appliance Insulators, Coil Forms and Bobbins.

Electronics

Wafer Chucks, Insulators, Vacuum Tube Structures, Microwave Housings, Arc Barriers, X-Ray Equipment, and PVD Applications.

Heat Treating

Brazing and Carburizing Fixtures, Induction Heating Tubes, Furnace and Tooling Insulation, Guides, Kiln Furniture, Welding Jigs, Hot Forming Dies.

Metallurgical

Molten Metal Crucibles, Nozzles, Troughs, Liners, Transfer Rollers, Structural Parts, Filters, Thermocouple Sheaths, Permanent Molds.

Petrochemical

High Temperature Corrosion and Wear-Resistant Components.

Plastics

Hot Die Parts for Thermoplastic Forming Equipment.

MACHINABLE GRADES

502-600 Glass-Ceramic

Recommended for high dielectric and mechanical strength requirements and temperatures to 1100 °F (593 °C). Used for high voltage insulators, lamp housings, insulation sleeves and washers, thermal switches, and radiation parts. Readily machined and no firing required. Plates are available from 1/8" to 1" thick; rods from 1/4" to 1" diameter.

502-800 Macor Glass-Ceramic

Recommended for temperatures to 1472 °F (800 °C) and peaks up to 1832 °F (1000 °C). Demonstrates low thermal conductivity, high strength, high electrical insulation, zero porosity, non-wetting, and coefficient of thermal expansion similar to most metals and sealing glasses. Machines to tight tolerances up to 0.0005", surface finish of less than 20µin, and polishes to a smoothness of 0.5µin. Used for ultra high vacuum, aerospace, nuclear, welding, fixturing, and medical applications. Readily machined and no firing required. Bars, disks, rods and plates are available from 1/16" thick up to 12" diameter.

502-900 Calcium Silicate (CS-85)

Structural insulation that combines high strength and excellent thermal insulating characteristics for use in heat treating, fire protection, and electrical applications. Also ideal for direct contact with non-ferrous metals. Machines easily and is available in 1/4" to 3" thick sheets × 4' × 8'.

502-1100-UF Alumino-Silicate, Unfired (Lava)

Machined easily to close tolerances and can be used as-is or fired to increase temperature resistance and improve mechanical strength. Used for prototyping and small production runs of electrical and thermal insulators and brazing and heat-treating fixtures. Standard plates from 1/4" to 1" thick × 12" × 12"; rods from 1/4" to 4" diameter × 12"; bars from 1" × 1" to 4" × 4" × 12".

502-1400-BF Aluminum Oxide, 96%, Partially Fired

Partially Fired alumina is machined easily to close tolerances and can be used as-is or fired to increase mechanical and thermal properties. This ceramic offers excellent corrosion, abrasion, wear, and electrical and thermal shock resistance. Used for producing guides, fixtures, nozzles, pump liners, shafts, valve seats, and more. Plates are available from 1/4" to 3/4" thick × 6" × 6"; rods from 1/4" to 3" diameter × 10" long.

502-1600 Boron Nitride, 99%

Hot-pressed boron nitride provides high thermal conductivity, electrical insulation, and low coefficient of thermal expansion. Grades are non-reactive with molten salts, aluminum and other metals. Easily machined and available in plates from 1/4" to 1" thick; rods from 1/4" to 3" diameter by 12" long, and bars from 1/4" × 1/4" to 2" × 2".

FULL-FIRED, DENSE CERAMICS

502-676 Magnesium Oxide

This is a high density, fine grain, 99.38% magnesium oxide fabricated into thin-walled crucibles from 1" to 6" diameter and 1" to 10" high for applications to 3270 °F (1800 °C). Used

for processing beta-alumina, metal alloys, piezoelectrics, and superconductors.

502-1100-FF Alumino-Silicate, Full-Fired (Lava)

Offers higher temperature resistance and improved mechanical strength over 502-1100-UF. Used for prototyping and small production runs of electrical and thermal insulators, such as sleeves and washers, and brazing and heat-treating fixtures. Recommended for producing insulators, standoffs, feed-thrus, furnace carriers, and brazing fixtures.

502-1400-96 Alumina, Full-Fired, 96%

High strength aluminum oxide offers excellent corrosion, abrasion, wear, and electrical and thermal shock resistance. Used for producing guides, fixtures, nozzles, pump liners, shafts, valve seats, and more.

502-1400-998 Alumina, Full-Fired, 99.8%

Higher strength, higher purity aluminum oxide ideal for metallurgical applications in which sensitivity to impurities may exist.

502-1900-MSZ Magnesia Partially Stabilized Zirconia

This grade offers the highest level of fracture toughness of all the zirconia materials and far exceeds that of aluminum oxide. Features include excellent fracture, corrosion, thermal shock, and wear resistance. Used for pump parts, valve components, bearings, and wear linings.

502-1900-YTZP Yttria Stabilized Zirconia

This grade offers the highest flexural strength of all the zirconia materials. The fine grain size lends itself to be used in cutting tools where a very sharp edge can be achieved and maintained due to its high wear resistance. Also provides excellent mechanical strength, corrosion and thermal shock resistance, impact toughness, and very low thermal conductivity. Used for structural components, wear parts, fiber optic ferrules and sleeves, oxygen sensors, solid oxide fuel cells.

BORON NITRIDE COMPOSITES

502-1810 BN-Al₂O₃

Hot-pressed BN-Al₂O₃ demonstrates good mechanical, thermal conductivity and electrical properties compared to BN. For use at temperatures to 1000 °C in air and 1700 °C in a vacuum or inert atmosphere. Ideal for producing gas atomization nozzles for the thermal spray industry.

502-1820 BN-AlN

Hot-pressed BN-AlN demonstrates high thermal conductivity and electrical resistivity, and good mechanical properties compared to BN. For use at temperatures to 1000 °C in air and 1800 °C in a vacuum or inert atmosphere. Ideal for applications requiring high thermal conductivity and electrical insulation in the semiconductor industry.

502-1830 BN-ZrO₂

Hot-pressed BN-ZrO₂ demonstrates the highest mechanical strength of all BN composites. Ideal for metallurgical/foundry applications for producing molds, molten liquid nozzles, and continuous casting separation rings.



502-600



502-800



502-1100-FF



502-1100-UF



502-1600

MACHINABLE CERAMICS

| Material Properties | 502-600 | 502-800 | 502-900 | 502-1100-UF | 502-1100-FF | 502-1400-BF | 502-1600 [†] |
|---|----------------------|----------------------|------------------------|---------------------------|-----------------------------|---------------------------|------------------------|
| Composition-Purity | Glass Ceramic | Macor Glass Ceramic | CS-85 Calcium Silicate | Alumino-Silicate Un-Fired | Alumino-Silicate Full-Fired | Alumina, 96% Bisque-Fired | Boron Nitride, 99% |
| Thermal Properties | | | | | | | |
| Max Use Temperature | | | | | | | |
| Oxidizing, °F, (°C) | 1100 (593) | 1472 (800) | 1800 (1000) | 1000 (537) | 2100 (1150) | 2600 (1427) | 1650 (900) |
| Vacuum, °F, (°C) | 1100 (593) | 1472 (800) | 1800 (1000) | 1000 (537) | 2100 (1150) | 2600 (1427) | 3270 (1800) |
| Inert, °F, (°C) | 1100 (593) | 1472 (800) | 1800 (1000) | 1000 (537) | 2100 (1150) | 2600 (1427) | 3990 (2200) |
| Coefficient Thermal Expansion, in/in/°F x 10⁻⁶ (°C) | 5.8 (10.5) | 7.0 (12.6) | — | 2.5 (4.5) | 2.9 (5.2) | 3.5 (6.3) | 0.2 (0.3) |
| Thermal Conductivity, W/m-K | 1.3 | 1.5 | 0.3 | 1.6 | 1.3 | 4.3 | 50 |
| Mechanical Properties | | | | | | | |
| Compressive Strength, psi (Mpa) | 32,000 (221) | 50,000 (345) | 10,300 (71) | 12,000 (83) | 25,000 (172) | 9,000 (62) | 12,300 (85) |
| Flexural Strength, psi (Mpa) | 11,000 (72.9) | 13,600 (94) | 3,000 (21) | 4,000 (28) | 10,000 (69) | 4,000 (28) | 5,075 (35) |
| Hardness, Rockwell A | 47 | 48 | — | 39 | 45 | 42 | 19 |
| Electrical Properties | | | | | | | |
| Volume Resistivity, ohm-cm | 1 × 10 ¹² | 1 × 10 ¹⁷ | 4.5 × 10 ¹² | 1 × 10 ¹⁴ | 1 × 10 ¹⁴ | 1 × 10 ¹⁴ | > 1 × 10 ¹⁴ |
| Dielectric Strength, volts/mil | 380 | 785 | 61 | 80 | 100 | 80 | 865 |
| Dielectric Loss, 1 MHz | 0.012 | ~0.005 | — | 0.06 | 0.053 | 0.003 | < 0.0002 |
| Dielectric Constant, 1 MHz | 6.8 | ~6.0 | — | 5.8 | 5.3 | 5.5 | 4 |
| Physical Properties | | | | | | | |
| Density, g/cc | 2.80 | 2.52 | 1.36 | 2.60 | 2.30 | 3.00 | 2.00 |
| Water Absorption, % | 0.0 | 0.0 | — | 2.5 | 2.3 | 25 | — |

[†]Measurements taken at 25 °C. Additional data at elevated temperatures may be available upon request.

MACHINING GUIDELINES

Fixturing

Hold parts carefully to prevent chipping or cracking. Place soft paper sheet in between ceramic and gripping jaws as needed. Support plates for drilling or milling operations using a soft backup block and mounting adhesive such as Aremco's Crystalbond 509 or 590 (refer to Technical Bulletin A9). Support cylinders using an internal metal sleeve. Do not use pointed screws to hold parts.

Lubricant

A low concentrate water-soluble lubricant is recommended for 502-600 and 502-800. Dry machining is recommended for 502-1100-UF, 502-1400-BF, 502-1600-99 because these ceramics have high open porosity and absorb water readily.

Cutting

Use sharp cutting tools only as ceramics are abrasive and dull cutters may cause localized heating that leads to chipping. Carbide tools (Titanium coated or Tungsten) and/or bonded diamond wheels are preferred but high-speed tools can be used for short runs. Cut downwards into the work, never up from the bottom. Maintain speeds from 2000–2500 rpm and advance the cut by feel.

Drilling

Solid carbide drills, preferably with micro-grain carbide, will give best results. Do not drill thru in order to avoid chipping. For best results, work from one side, then rotate piece and work from the other side. Otherwise, allow for $\frac{1}{16}$ " of extra material on drill break-thru side to allow for grinding cleanup. For large quantities, accurate two-sided hardened bushed drill jigs will provide accurate results. The drill should be advanced slowly by $\frac{1}{4}$ " per turn.

| Drill Size | Spindle Speed* | Feed Rate |
|-----------------|----------------|-----------|
| $\frac{1}{4}$ " | 300–2000 rpm | .003–.005 |
| $\frac{1}{2}$ " | 250–1200 rpm | .004–.007 |
| $\frac{3}{4}$ " | 200–700 rpm | .005–.010 |
| 1" | 100–300 rpm | .006–.012 |

*The higher end of the speed range is recommended for most products except 502-800 Macor.

Grinding

Use silicon carbide resin-bonded wheels for surface grinding at speeds recommended by the wheel manufacturer. Use a soft, coarse-grained wheel for heavy grinding. Use 1% soluble oil solution to extend life of grinding wheels. Use a 35-grit Blanchard-Besley type grinder for rough heavy grind; use a 60–80-grit wheel for surface grinders.

Milling

Micro-grain Carbide end mills are recommended.

| Drill Size | Spindle Speed |
|-----------------|---------------|
| $\frac{1}{4}$ " | < 1000 rpm |
| $\frac{1}{2}$ " | < 800 rpm |
| $\frac{3}{4}$ " | < 600 rpm |
| 1" | < 400 rpm |

Depth of Cut .050–.070" per cut
Feed Rate 3" per minute

Slotting

Slotting may be accomplished using a metal-bonded diamond or silicon carbide wheel on a surface grinder for slots up to 0.050". Alternatively, a carbide end-mill can be used making small cuts up to 0.025" with plenty of lubricant.

Tapping

Use sharp tungsten carbide tool bits. For internal threads, make clearance holes slightly larger than standard tap drill recommendations. Chamfer both sides of hole prior to threading to minimize chipping. Run the tap in one direction only as turning the tap back and forth can cause chipping. Continuously flush with air, water or coolant to clear chips and dust from the tap.

Cleaning

When coolant is used, bake out parts at 200–250 °F for 1–2 hours to remove residual moisture. Remove any discoloration caused by the lubricant by clean firing up to 1000 °F.

502-1100-UF Unfired—Machining & Firing Notes

Typical tolerances after firing are $\pm 1\%$ or ± 0.005 " whichever is greater. Tighter tolerances can be achieved by wet grinding after firing. Machine all dimensions 1–2% undersize to allow for expansion during firing. All dimensions including centered and off-centered internal holes will increase by this percentage after firing. Maximum recommended cross-sectional thickness is $\frac{3}{8}$ ". Hollow cut or drill holes thru the unfired ceramic to maintain a $\frac{3}{8}$ " maximum cross-section. When it is necessary to exceed $\frac{3}{8}$ ", do not exceed $\frac{5}{8}$ " and the rate of firing should be slowed.

Bake at 200 °F for two hours to remove moisture and increase temperature at a rate of 200 °F per hour maximum (slower for thicker sections) to 1100 °F. Soak at 1100 °F for six hours, then increase temperature at a rate of 200 °F per hour to 2050 °F and soak for 30 minutes for each $\frac{1}{4}$ " of cross-section (eg. soak a $\frac{1}{2}$ " thick part for one hour). Turn off furnace and allow cooling to below 150 °F before removing parts.

502-1400-BF Bisque-Fired—Firing Notes

This product has been bisque-fired to 2475 °F, but additional firing to 3075–3125 °F can be performed to achieve high density, hardness and mechanical strength. Allow for 15–18% shrinkage using the following firing schedule. Raise temperature 500 °F per hour to 2000 °F and 200 °F per hour to 3125 °F. Soak for 12 hours then cool to room temperature before removing parts.

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.



502-1400-96



502-1400-96 + Glazing



502-1400-998



502-676

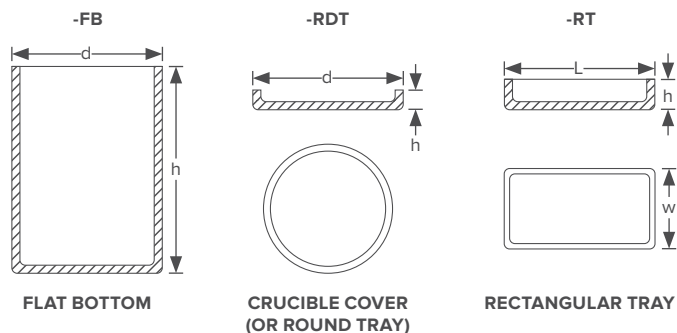
DENSE CERAMICS — ALUMINUM OXIDE, MAGNESIUM OXIDE, ZIRCONIUM OXIDE

| Material Properties ¹ | 502-1400-96 | 502-1400-998 | 502-676 | 502-1900-MSZ | 502-1900-YTZP |
|---|------------------------------------|-------------------------|---------------------------------------|---|--|
| Composition-Purity | Aluminum Oxide 96% ² | Aluminum Oxide 99.8% | Magnesium Oxide ² 99.4% | Zirconia Magnesia Stabilized (3.5%) | Zirconia Yttria Stabilized (12.0%) |
| Thermal Properties | | | | | |
| Max Use Temperature | 3100 (1700) | 3050 (1675) | 3270 (1800) | 2200 (1200) | 930 (500) |
| Coefficient Thermal Expansion, in/in/°F x 10⁻⁶ (°C) | 3.5 (6.3) | 3.6 (6.5) | 7.7 (13.9) | 4.9 (8.9) | 3.8 (6.9) |
| Thermal Conductivity, W/m-K | 23 | 30 | 2.2 | 3 | 2.2 |
| Mechanical Properties | | | | | |
| Compressive Strength, psi (Mpa) | 300,000 (2,070) | 325,000 (2,240) | 120,000 (830) | 270,000 (1860) | 360,000 (2,485) |
| Flexural Strength, psi (Mpa) | 52,000 (360) | 55,000 (380) | 35,500 (240) | 90,000 (620) | 13,800 (950) |
| Fracture Toughness, Mpa.m^{0.5} | 4–5 | 3–4 | — | 12 | 10 |
| Hardness, Rockwell R-45N | 81 | 86 | 70 | 78 | 80 |
| Electrical Properties | | | | | |
| Volume Resistivity, ohm-cm | > 1 × 10 ¹⁴ | > 1 × 10 ¹⁴ | 1 × 10 ¹² | > 1 × 10 ¹³ | > 1 × 10 ¹³ |
| Dielectric Strength, volts/mil | 250 | 290 | 150 | 300 | 240 |
| Dielectric Loss, 1 MHz | 0.0004 | < 0.0001 | — | 0.0016 | — |
| Dielectric Constant, 1 MHz | 9.1 | 9.8 | 9.6 | 22.7 | 30.0 |
| Physical Properties | | | | | |
| Density, g/cc | 3.71 | 3.91 | 3.45 | 5.72 | 6.02 |
| Gas Permeability | Gas Tight | Gas Tight | — | Gas Tight | Gas Tight |
| Water Absorption, % | 0.0 | 0.0 | 4.5 | 0.0 | 0.0 |
| Color | White | Ivory | Light-Brown | Light-Yellow | Ivory |

Reference Notes

¹ Property measurements were taken at 25 °C. Additional data at elevated temperatures may be available upon request.

² Slip-cast crucibles and flanged lids are available in stock shapes up to 6" diameter and 10" high.

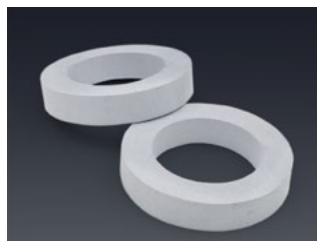




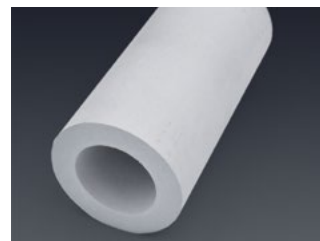
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502-1820



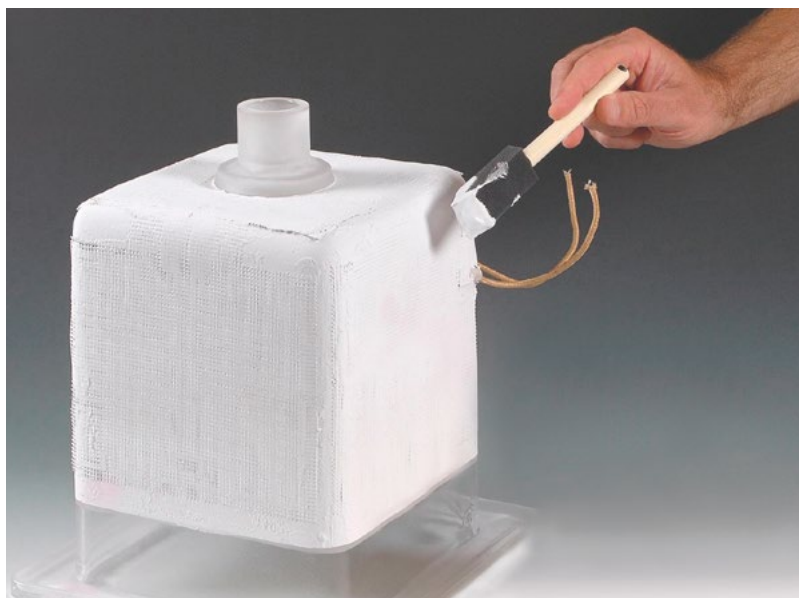
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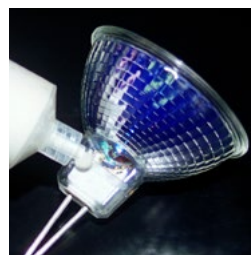
502-1830

DENSE CERAMICS — BN COMPOSITES

| Material Properties ¹ | 502-1810 | 502-1820 | 502-1830 |
|---|-------------------------------------|-------------------------------|-------------------------------|
| Composition | BN + Al ₂ O ₃ | BN + AlN | BN + ZrO ₂ |
| Binder | B ₂ O ₃ | B ₂ O ₃ | B ₂ O ₃ |
| Thermal Properties | | | |
| Max Use Temperature | | | |
| Oxidizing, °F, (°C) | 1830 (1000) | 1830 (1000) | 1830 (1000) |
| Vacuum, °F, (°C) | 3180 (1750) | 3270 (1800) | 3180 (1750) |
| Inert, °F, (°C) | 3180 (1750) | 3270 (1800) | 3180 (1750) |
| Coefficient Thermal Expansion, in/in/°F x 10 ⁻⁶ (°C) | 1.1 (2.0) | 1.6 (2.8) | 2.0 (3.5) |
| Thermal Conductivity, W/m-K | 30 | 85 | 30 |
| Mechanical Properties | | | |
| Compressive Strength, psi (Mpa) | 21,025 (145) | 27,725 (205) | 31,900 (220) |
| Flexural Strength, psi (Mpa) | 9,425 (65) | 12,325 (85) | 13,050 (90) |
| Electrical Properties | | | |
| Volume Resistivity, ohm-cm | > 1 × 10 ¹³ | > 1 × 10 ¹³ | 1 × 10 ¹² |
| Dielectric Constant, 1 MHz | 3.8 | 7.2 | 8.5 |
| Physical Properties | | | |
| Density, g/cc | 2.25–2.35 | 2.75–2.85 | 2.90–3.00 |
| Water Absorption, % | 1.8 | 1.3 | 1.2 |
| Color | Light Grey | Grey | Grey |



Cerabond™ 569 bonds flex heater to quartz vessel.



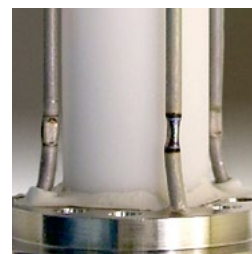
Cerabond™ 835-M bonds halogen lamp.



Cerabond™ 503 coats heater used to 1700 °C.



Cerabond™ 503 coats spiral cantilevered sensor.



Ultra-Temp™ 516 seals heater assembly.

Aremco's high temperature ceramic adhesives are formulated using a broad range of ceramics fillers and inorganic binders, and are ideal for bonding, potting and sealing ceramics, composites, graphite, refractory metals, quartz, and semiconductors for applications to 3200 °F (1760 °C).

TYPICAL APPLICATIONS

Electrical

- Halogen Lamps
- Heaters
- Igniters
- Fiberoptics
- Resistors
- Solid Oxide Fuel Cells

Instruments & Sensors

- Gas Chromatographs
- High Vacuum Components
- Liquid Metal Inclusion Counters
- Mass Spectrometers
- Oxygen Analyzers
- Strain Gauges
- Semiconductors
- Temperature Probes

Mechanical

- Ceramic Honeycombs
- Ceramic Textiles
- Graphite Blocks
- Refractory Insulation
- Sagger Plates
- Thread-Locking

| Part No. | Filler | Bonding* | Principal Use |
|----------|---|------------------|---|
| 503 | Al ₂ O ₃ | C-C | Dense Ceramics; Alumina-to-Alumina |
| 552 | | C-C, C-M | Solid Oxide Fuel Cells; Low CTE Metals |
| 569 | | C-C, C-M, Quartz | Probes, Sensors, Resistors, Igniters, Heaters |
| 670 | | C-C, C-M | Ceramic Textiles, Thread-Locking |
| 671 | | C-C, C-M, M-M | Ceramic Textiles, Thread-Locking |
| 835-M | | C-C, C-M, Quartz | Halogen Lamps |
| 865 | AlN | C-C, C-M | Probes & Sensors; Thermal Conductivity |
| 600-N | Al ₂ O ₃ - SiO ₂ | C-C, C-M | Refractory Repair |
| 571 | MgO | C-M, M-M | Heaters, Induction Coils, Sensors |
| 618-N | SiO ₂ | C-C, Quartz | Porous Ceramics, Quartz Tubes & Vessels |
| 516 | ZrO ₂ - ZrSiO ₄ | C-C, C-M | Thermocouples, Semiconductor Wafers |
| 835 | | C-C, C-M | Halogen Lamps |
| 885 | ZrO ₂ | C-C | Zirconia, Solid Oxide Fuel Cells |
| 885-K | | C-M | |
| 890 | SiC | C-C | Crucibles, Heaters, Sagger Plates |
| 890-K | | C-M | Probes, Sensors, Infrared Heaters |

*C-C = Ceramic-to-Ceramic C-M = Ceramic-to-Metal M-M = Metal-to-Metal

CERAMABOND™ — HIGH TEMPERATURE CERAMIC ADHESIVES PROPERTIES

| Part Number | | 503 | 552 | 569 | 670 | 671 | 835-M | 600-N | 865 |
|---------------------------------------|-----------------------------|--------------------------------|--------------------|-------------|-------------|---------------|---------------|---|--------------------------------|
| Major Constituent | | Al ₂ O ₃ | | | | | | Al ₂ O ₃ – SiO ₂ | AlN |
| Color | | White | White | White | White | White | White | Tan | Gray |
| Temperature Limit, °F (°C) | | 3000 (1650) | 3000 (1650) | 3000 (1650) | 3000 (1650) | 3200 (1760) | 3000 (1650) | 3000 (1650) | 3000 (1650) |
| No. Components | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP | | 50,000–90,000 | 53,000–73,000 | Paste | 2,500–5,000 | 40,000–80,000 | 30,000–40,000 | 5,000–15,000 | Paste |
| Specific Gravity, g/cc | | 2.35–2.55 | 1.90–2.20 | 2.15–2.30 | 1.80–1.95 | 2.05–2.15 | 2.35–2.45 | 2.00–2.05 | 1.95–2.15 |
| CTE, in/in/°F × 10 ⁻⁶ (°C) | | 4.0 (7.2) | 4.3 (7.7) | 4.2 (7.6) | 4.3 (7.7) | 4.3 (7.7) | 4.0 (7.2) | 3.0 (5.4) | 1.5 (2.7) |
| Handling | Mix Ratio, powder:liquid | NA | NA | NA | NA | NA | NA | NA | NA |
| | Thinner | 503-T | 552-T | 569-T | 670-T | 671-T | 835-M-T | 600-T | 865-T |
| | Solvent | Water | Water | Water | Water | Water | Water | Water | Water |
| | Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 |
| | Storage Temperature, °F | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |
| | Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Curing | Air Set, hrs | ≤ 1 | 1–4 | 1–4 | 1–4 | 1–4 | 1–4 | 1–4 | 1–4 |
| | Heat Cure, °F, hrs | 200, 2 + 500, 2 + 700, 2 | 200, 2 + 500, 2 | 200, 2 | 200, 2 | 200, 2 | 200, 2 | 200, 2 + 350, 1 | 200, 2 + 350, 2 + 500, 2 |
| Dielectric Strength, volts/mil @ RT | | 171 | 173 | 138 | 142 | 182 | 163 | 203 | 187 |
| Torque Strength, ft-lbs ¹ | | 60 | 52 | 38 | 60 | 57 | 63 | 14 | 27 |
| Moisture Resistance ² | | Good | Excellent | Excellent | Excellent | Excellent | Good | Excellent | Excellent |
| Alkali Resistance ² | | Fair | Good | Good | Good | Excellent | Excellent | Good | Good |
| Acid Resistance ² | | Excellent | Good | Excellent | Good | Good | Good | Good | Good |

Footnotes

¹ Tested using a torque wrench after bonding a pre-oxidized ½"–13 nut and bolt and final curing at 1000 °F.

² Properties were evaluated after curing at 700 °F for 2 hours.

General Notes

1. Ceramabond adhesives do not contain volatile organic compounds (VOCs).
2. Special pigments available upon request.
3. Many adhesives including 503, 516, 552, 569, 571, 618-N, 671, 835-M, and 890 can be formulated using 1-5 micron ceramic powders. Add "-VFG" to the part number (eg. 503-VFG).

Abbreviations

NA Not Applicable
NM Not Measured

CERAMABOND™ — HIGH TEMPERATURE CERAMIC ADHESIVES PROPERTIES

| Part Number | | 571 | 618-N | 890 | 890-K | 516 | 835 | 885 | 885-K |
|---------------------------------------|-----------------------------|----------------------------|--------------------------------|--------------------------------|--------------------|---------------------------------------|---------------|--------------------------------|--------------------|
| Major Constituent | | MgO | SiO ₂ | SiC | | ZrO ₂ – ZrSiO ₄ | | ZrO ₂ | |
| Color | | Off-White | Off-White | Blue-Gray | Blue-Gray | Tan | Tan | Tan | Tan |
| Temperature Limit, °F (°C) | | 3200 (1760) | 3000 (1650) | 3000 (1650) | 3000 (1650) | 3200 (1760) | 3000 (1650) | 3200 (1760) | 3200 (1760) |
| No. Components | | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP | | 20,000–90,000 ³ | 40,000–60,000 | 35,000–55,000 | 10,000–40,000 | 40,000–70,000 | 20,000–40,000 | 10,000–20,000 | 10,000–30,000 |
| Specific Gravity, g/cc | | 1.90–2.20 | 1.80–1.90 | 1.70–1.75 | 2.35–2.45 | 2.15–2.30 | 2.25–2.35 | 2.65–2.70 | 2.65–2.70 |
| CTE, in/in/°F × 10 ⁻⁶ (°C) | | 7.0 (12.6) | .33 (.59) | 2.4 (4.4) | 3.0 (5.4) | 4.1 (7.4) | 4.0 (7.2) | 4.0 (7.2) | 4.2 (7.6) |
| Handling | Mix Ratio, powder:liquid | 1.0:1.0, 1.5:1.0 | NA | NA | NA | NA | NA | NA | NA |
| | Thinner | 571-T | 618-N-T | 890-T | 890-K-T | 516-T | 835-T | 885-T | 885-K-T |
| | Solvent | Water | Water | Water | Water | Water | Water | Water | Water |
| | Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 |
| | Storage Temperature, °F | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |
| | Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Curing | Air Set, hrs | 1–4 | 1–4 | ≤ 1 | 1–4 | 1–4 | ≤ 1 | ≤ 1 | 1–4 |
| | Heat Cure, °F, hrs | 200, 2 | 200, 2 + 500, 2 + 700, 2 | 200, 2 + 500, 2 + 700, 2 | 200, 2 + 500, 2 | 200, 2 + 500, 2 + 700, 2 | 200, 2 | 200, 2 + 500, 2 + 700, 2 | 200, 2 + 500, 2 |
| Dielectric Strength, volts/mil @ RT | | 91 | 156 | 73 | 95 | 188 | 111 | 105 | 88 |
| Torque Strength, ft-lbs ¹ | | 22 | 77 | 40 | 50 | 50 | 50 | 40 | 20 |
| Moisture Resistance ² | | Excellent | Excellent | Good | Good | Good | Good | Good | Good |
| Alkali Resistance ² | | Good | Good | Good | Good | Excellent | Good | Good | Good |
| Acid Resistance ² | | Fair | Good | Good | Good | Good | Good | Good | Good |

Footnotes

¹ Tested using a torque wrench after bonding a pre-oxidized ½"–13 nut and bolt and final curing at 1000 °F.

² Properties were evaluated after curing at 700 °F for 2 hours.

³ Ceramabond™ 571 ranges for viscosity and specific gravity reflect a powder-to-liquid mix ratio that ranges from 1-to-1 to 1.5-to-1.

General Notes

1. Ceramabond adhesives do not contain volatile organic compounds (VOCs).
2. Special pigments available upon request.
3. Many adhesives including 503, 516, 552, 569, 571, 618-N, 671, 835-M, and 890 can be formulated using 1-5 micron ceramic powders. Add "-VFG" to the part number (eg. 503-VFG).

Abbreviations

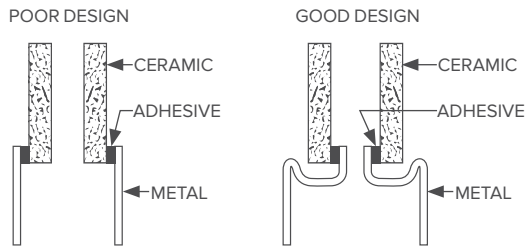
NA Not Applicable
NM Not Measured

DESIGN GUIDELINES

General design criteria for bonding with ceramic adhesives are similar to those for epoxy adhesives. Main considerations include the **coefficient of thermal expansion**, **joint design**, **glue line thickness**, and **operating environment**.

Coefficient of Thermal Expansion

CERAMIC-TO-METAL RECOMMENDED DESIGN

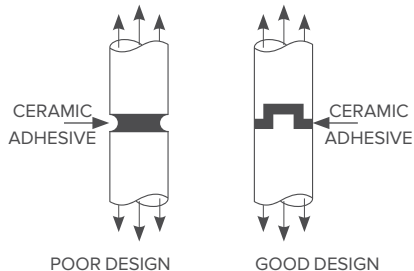


Due to the high thermal loading implicit in most ceramic adhesive applications, the joint design should account for the difference in the coefficient of thermal expansion between the adhesive and the components that are being joined. In the illustration above, note that the “poor” design loads the adhesive in tension since the metal expands faster than the ceramic. The “good” design allows for this thermal mismatch and loads the adhesion in compression, offering higher reliability.

Joint Design

Most adhesives offer relatively poor tensile-shear strength, so it is important to design a joint that will distribute the mechanical stress by maximizing the length of the glue line as shown in this illustration.

CERAMIC-TO-CERAMIC RECOMMENDED JOINT DESIGN



Glue Line Thickness

The clearance between mating parts at operating temperature should be 2–8 mils (50–200 microns). Less than 2 mils will prevent uniform adhesion; greater than 8 mils will often result in cohesive shear failure within the adhesive. A maximum depth of 0.25" is recommended when using a ceramic adhesive for a small potting application.

Operating Environment

These adhesives offer excellent chemical, electrical and ultra high thermal resistance, and do not outgas under high vacuum. The main limitations are (a) relatively low mechanical strength and (b) slight porosity after curing. Contact Aremco for suggestions about how to reduce porosity and produce gas-tight seals.

APPLICATION PROCEDURES

Surface Preparation

Smooth surfaces are difficult to bond and should be etched, abrasive blasted or oxidized, then cleaned thoroughly prior to application. Aremco's Corr-Prep™ CPR2000 is recommended for etching metals. Porous substrates should be pre-coated with a binder (thinner) to prevent separation and absorption of the adhesive binder. Add a “-T” to the part number (eg. 503-T) to designate the product thinner.

Mixing

One-part adhesives tend to settle and should be mixed thoroughly prior to use. Refer to Tech Bulletin A12 for information about Aremco's **Model 7000 Pneumatic Mixer**. Mix ratios for two-part adhesives are shown in the Property Chart. Viscosity may be adjusted by thinning up to 20% by weight.

Application

Apply a thin coat of adhesive to each surface using a brush, spatula or dispenser. Using a clamp or similar tool, maintain a uniform glue line of 2–8 mils (200–500 microns) by applying even pressure across the assembly. Wipe away excess material prior to drying. Refer to Tech Bulletin A12 for optional dispensing tools.



Model 7000 Mixer

Curing

Refer to the Property Chart for specific curing instructions for each product. A ramp rate of ~5 °F per minutes is recommended. If any blistering occurs, repeat curing process by slowing down the ramp rate. Blistering may be caused by an excessively quick release of water vapor from the adhesive.

Note that Ceramabond adhesives cure by dehydration.

Although the primary outgassing by-product is water vapor, small amounts of inorganic binder and ceramic filler may also attach to the water vapor during the curing cycle. Although most of the dehydration occurs at 200–350 °F, chemically absorbed water may remain until the adhesive is exposed to temperatures in excess of 700–800 °F.

Cleanup

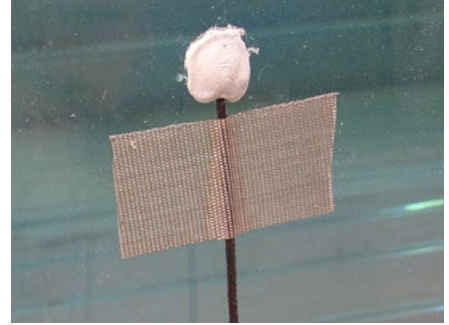
Uncured material can be cleaned with warm water and soap. Cured material can often be removed using warm water and ultrasonics. Cured material that has been cycled to ultra-high temperatures is more difficult to remove; it can be softened sometimes with warm water and ultrasonics, but a strong acid such as HCl may be required for removal. Mechanical abrasion may also be necessary.



Ceramabond™ 571 coats copper induction heater.



Ceramabond™ 571 coats oxygen sensor.



Ceramabond™ 571 bonds thermocouple to glass.



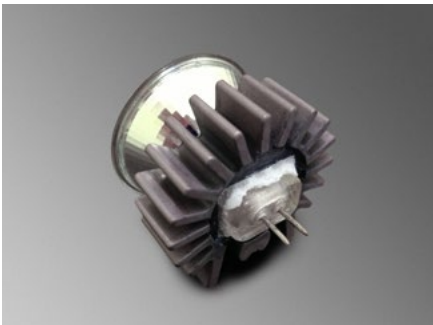
Ceramabond™ 618-N bonds porous ceramic filter elements.



Ceramabond™ 671 used as a high temp threadlocker.



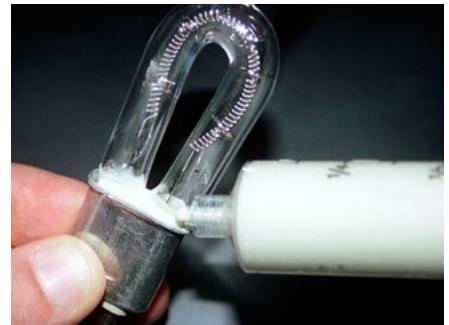
Ceramabond™ 503 repairs furnace saggar plate.



Ceramabond™ 835-M bonds heat sink to halogen lamp.



Ultra-Temp™ 516 bonds thermocouple to quartz tube.



Ceramabond™ 835 bonds halogen lamp.



Ceramabond™ 552 seals thermocouple in metal housing.



Ceramabond™ 835-M bonds cover to halogen lamp.



Ceramabond™ 835-M bonds halogen lamp.

CERAMIC ADHESIVE SELECTOR CHART

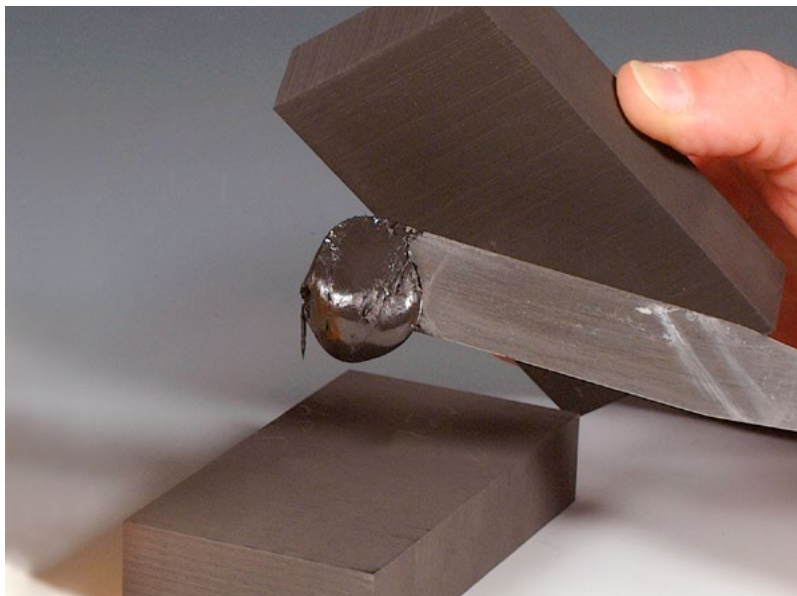
| | Material | CTE °F (°C) | 503 | 552 | 569 | 670 | 671 | 835-M | 600-N | 865 | 571 | 618-N | 890 | 890-K | 516 | 835 | 885 | 885-K |
|----------|------------------------|-------------|--------------------------------|-----|-----|-----|-----|-------|---|-----|-----|------------------|-----|-------|---------------------------------------|-----|------------------|-------|
| | | | Al ₂ O ₃ | | | | | | Al ₂ O ₃ – SiO ₂ | AlN | MgO | SiO ₂ | SiC | | ZrO ₂ – ZrSiO ₄ | | ZrO ₂ | |
| CERAMICS | Alumina | 4.4 (7.9) | • | • | • | • | • | • | | | x | | | | | | | |
| | Alumina-Silica | 1.8 (3.2) | | | | | | | x | | | | | | | | | |
| | Aluminum Nitride | 1.5 (2.7) | | | | | | | | • | | x | | | | | | |
| | Beryllia | 4.1 (7.4) | • | x | x | x | x | x | | | | | | | x | x | x | |
| | Boron Carbide | 2.6 (4.7) | x | | | | | | | | | | x | | | | | |
| | Boron Nitride | 4.2 (7.6) | x | | | | | | | | | | | | | | | |
| | Borosilicate Glass | 1.8 (3.2) | x | | | | | | | | | • | | | | | | |
| | Calcium Silicate | 3.0 (5.4) | | | | • | | | | | | | | | | | | |
| | Ceramic Textile | – | | | | • | x | | | | | | | | | | | |
| | Cordierite | 1.1 (2.0) | | | | | | | | | | • | | | | | | |
| | Graphite | 4.3 (7.7) | x | | | | | | | | | | x | | | | | |
| | Macor | 5.2 (9.4) | | x | • | x | x | x | | | x | | | | | | | |
| | Mica | 4.7 (8.5) | | | | | | | | | | | | | | | | |
| | Mullite | 3.0 (5.4) | x | x | x | x | | | | | | | | | x | x | | |
| | Quartz | 0.30 (0.54) | x | | x | | | x | | | | • | | | | x | | |
| | Refractory, Dense | – | • | | | | | | | | | | • | • | | | x | |
| | Refractory, Porous | – | | | | | | | • | | | | | | | | | |
| | Sapphire | 4.2 (7.6) | • | | x | x | | x | | | | | | | | | | |
| | Silica | 0.31 (0.56) | | | | | | | | | | • | | | | | | |
| | Silicon Carbide | 2.9 (5.2) | x | | | | | | | | | | • | • | | | | |
| | Silicon Nitride | 1.8 (3.2) | x | | | | | | | x | | x | x | | | | | |
| METALS | Steatite | 4.0 (7.2) | | x | • | | x | x | | | | | | | | • | | |
| | Zirconia | 5.7 (10.3) | | | | | | | | | | | | | x | x | • | • |
| | Zirconia Silicate | 4.0 (7.2) | | | | | | | | | | | | | • | • | x | |
| | Aluminum | 15.0 (27.0) | | | | | | | | | • | | | | | | | |
| | Brass | 10.2 (18.4) | | | | | | | | | • | | | | | | | |
| | Cast Iron | 5.9 (10.6) | | x | x | x | x | x | | | • | | | | | | | |
| | Copper | 9.3 (16.7) | | | | | | | | | • | | | | | | | |
| | Inconel | 6.4 (11.5) | | x | x | x | x | x | | | • | | | | | | | |
| | Molybdenum | 2.9 (5.2) | | x | • | x | x | x | | | • | | | | x | x | | |
| | Nickel | 7.2 (13.0) | | | | | | | | | • | | | | | | | |
| | Nickel-Iron | 2.6 (4.7) | | x | • | x | x | x | | | | | | | x | x | | |
| | Platinum | 4.9 (8.8) | • | x | x | x | | | | | | | | | | | | |
| | Silicon | 1.6 (2.9) | | | | | | | | x | | | | | x | x | | |
| | Silver | 10.6 (19.1) | | | | | | | | | x | | | | | | | |
| | Stainless (300 Series) | 9.6 (17.3) | | | | | | | | | x | | x | | | | | x |
| | Stainless (400 Series) | 6.2 (11.2) | | x | x | x | x | x | | | • | | x | | x | x | | x |
| | Steel (1010) | 6.5 (11.7) | | x | x | x | x | x | | | • | | x | | x | x | | x |
| | Tantalum | 3.9 (7.0) | | x | x | x | x | x | | | x | | x | | x | x | | |
| | Titanium | 5.8 (10.4) | | x | x | x | x | x | | | • | | x | | x | x | | x |
| | Tungsten | 2.5 (4.5) | | x | • | x | x | x | | | | | | | x | x | | |

• = Preferred, x = Applicable

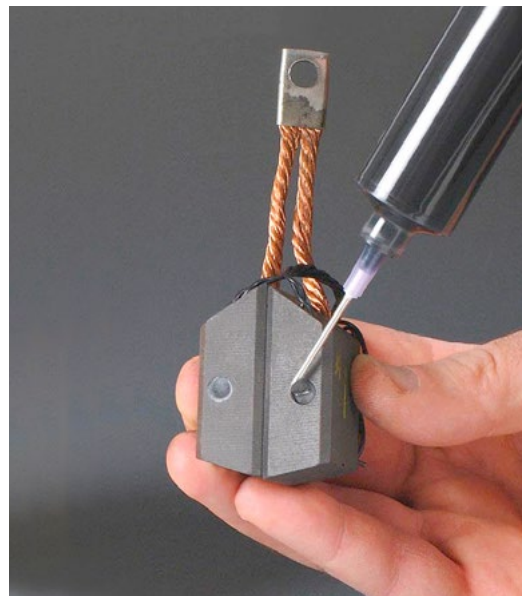
Refer to Price List for availability of sample kits and complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.



Graphi-Bond™ 551-RN bonds graphite blocks.



Graphi-Bond™ 551-RN seals sensor in carbon brushes.

Aremco's high temperature graphite adhesives are formulated using both phenolic and silicate binders to bond carbon, carbon fiber composite (CFC), and graphite components, structures and tools used in a broad range of applications to 5400 °F (2985 °C).

| Part No. | 551-RN | 551-RN-MV | 669 |
|------------------------|-------------------|-------------------|------------------|
| Filler | Graphite | Carbon | Graphite |
| Binder | Phenolic | Phenolic | Silicate |
| Consistency | High Viscosity | Medium Viscosity | Low Viscosity |
| Use Atmosphere | Reducing/Vacuum | Reducing/Vacuum | Oxidizing |
| Bond Strength | High | Ultra-High | Moderate |
| Max Temperature | 5400 °F (2985 °C) | 5400 °F (2985 °C) | 1400 °F (760 °C) |

TYPICAL APPLICATIONS

Bonding

- Graphite Insulation
- Carbon Brick
- Carbon Foam & Felt
- Carbon Fiber Composites
- Graphite Rams & Punches
- Graphite Sight Tubes
- Graphite Pour Spouts
- Graphite Foil to Rigid Graphite Insulation
- Graphite Foil to CFC

Laminating

- Carbon Fiber Composites

Repairing

- Graphite Trays, Dies, Jigs, Fixtures
- Patch Holes
- Fix Scratches
- Repair Susceptors

Sealing

- Porosity in Carbon & Graphite

HIGH TEMPERATURE GRAPHITE ADHESIVES PROPERTIES

| Part Number | | 551-RN ^{1,2} | 551-RN-MV ^{1,2} | 669 |
|--|-----------------------------|-----------------------|--------------------------|--------------------------|
| Tradename | | Graphi-Bond™ | | |
| Major Constituent | | Graphite | Carbon | Graphite |
| Color | | Black | Black | Black |
| Temperature Limit, °F (°C) | | 5400 (2985) | 5400 (2985) | 1400 (760) |
| No. Components | | 1 | 1 | 1 |
| Viscosity, cP | | Paste | 60,000–90,000 | 20,000–40,000 |
| Specific Gravity, g/cc | | 1.45–1.50 | 1.15–1.25 | 1.45–1.50 |
| CTE, in/in/°F × 10 ⁻⁶ (°C) | | 4.1 (7.4) | 4.1 (7.4) | 4.2 (7.6) |
| Handling | Mix Ratio, powder:liquid | NA | NA | NA |
| | Thinner | Ethanol ³ | Ethanol ³ | 669-T / H ₂ O |
| | Application Temperature, °F | 40–90 | 40–90 | 50–90 |
| | Storage Temperature, °F | 30–75 | 30–75 | 40–90 |
| | Shelf Life, months | 6 | 6 | 6 |
| Curing | Air Set, hrs | 1–4 | 1–4 | 1–4 |
| | Heat Cure, °F, hrs | 265, 4 + 500, 2 | 265, 4 + 500, 2 | 200, 2 |
| Bond Type | | 99% Carbonaceous | 99% Carbonaceous | Silicate-Graphite |
| Dielectric Strength, volts/mil @ RT | | 75 | 130 | 105 |
| Lap-Shear Strength, psi @ RT Post-Cure | | 810 | 1425 | 224 |
| Moisture Resistance | | Excellent | Excellent | Excellent |
| Alkali Resistance | | Good | Good | Good |
| Acid Resistance | | Good | Good | Good |

APPLICATION PROCEDURES

Surface Preparation

Remove any loose or embedded carbon or graphite dust thoroughly prior to adhesive application and make sure the substrate is completely dry and free of moisture.

Mixing

Make sure adhesive is brought to room temperature prior to application and remix as needed using a spatula or automatic equipment. Refer to Tech Bulletin A12 for information about Aremco's **Model 7000 Pneumatic Mixer**. Viscosity may be adjusted by using the thinner indicated in the property chart up to 20% by weight.

Application

Apply a thin coat of adhesive to each substrate using a proper tool. Use a clamp to maintain a uniform glue line thickness of 5–10 mils across the joint. Wipe away excess material prior to drying and curing.

Curing

Refer to the Property Chart for specific curing instructions for each product. Note that excessive film thickness or rapid heating may result in blisters.

Footnotes

¹ Graphi-Bond 551-RN and 551-RN-MV are also offered in a two-part, resin and powder, kit. Add “-X” to part number.

² Graphi-Bond 551-RN and 551-RN-MV volatile loss is complete at ~1300 °F (700 °C). Major loss occurs at 200–400 °C, methane at < 400 °C, hydrogen to 700 °C.

³ Graphi-Bond™ 551-RN and 551-RN-MV can also be thinned with methanol and isopropyl alcohol.

Abbreviations

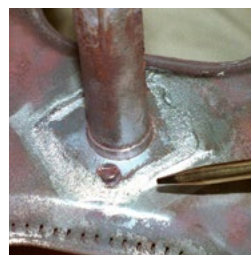
NA Not Applicable

Refer to Price List for availability of sample kits and complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Pyro-Putty® High Temperature Pastes are used to seal joints and repair defects in cast aluminum, cast iron, steel and stainless steel. Formulated using the most advanced organic and inorganic-ceramic technologies, these materials resist temperatures to over 2000 °F. Applications for Pyro-Putty® are widespread and found typically in the aerospace, automotive, foundry, heat-treating, incineration, and power generation industries.



Pyro-Putty® 653 seals corroded burner manifold.



Pyro-Putty® 950 seals turbo.

Ceramic-Metallic Filled Inorganic Pastes

Pyro-Putty® 653

- Ceramic & Stainless Filled, One-Part, Water-Based Paste
- For Vertical Surfaces to ½" Thick
- Repairs Cast Iron, Steel & Stainless Parts to 2000 °F

Pyro-Putty® 1000

- Ceramic & Aluminum Filled, Two-Part, Water-Based System
- For Vertical Surfaces to ½" Thick
- Repairs Cast Iron, Steel & Stainless Parts to 1400 °F

Pyro-Putty® 2400

- Ceramic & Stainless Filled, One-Part, Water-Based Paste
- For Applications to ¾" Thick
- Repairs Cast Iron, Steel & Stainless Parts to 2000 °F

Ceramic-Filled Resinous Pastes

Pyro-Putty® 950

- Ceramic Fiber Filled, Organic-Resinous Gasket Seal
- For sealing High Temperature Joints to 950 °F, 750 psi
- Cures to a Tough, Pliable, Chemically Resistant Material

Pyro-Putty® 1500

- Ceramic Fiber Filled, Organic-Resinous Gasket Seal
- Seals Boiler Doors & Molten Metal Systems
- Easy to Apply & Remove, For Uses to 2300 °F

TYPICAL APPLICATIONS

- Afterburners
- Boilers
- Castings
- Exhaust Stacks
- Headers
- Incinerators
- Manifolds
- Molds and Dies
- Heat Exchangers

TYPICAL APPLICATIONS

- Turbines
- Boilers
- Heat Exchangers
- Compressors
- Pumps
- Blowers
- Piping
- Ducting
- Furnaces
- Ovens
- Steam Valves
- Foundry Molds

PYRO-PUTTY® PROPERTIES

| Type | Ceramic-Metallic Filled Inorganic Pastes | | | Ceramic-Filled Resinous Pastes | |
|----------------------------|--|-------------------------------|-------------------------------|--------------------------------|--|
| Part Number | 653 | 1000 | 2400 | 950 | 1500 |
| Filler | Stainless | Aluminum | Stainless | Ceramic Fiber | Ceramic Fiber |
| Color | Metallic Gray | Light Gray | Metallic Gray | Silver Gray | Gray Brown |
| Temperature Limit, °F (°C) | 2000 (1093) | 1400 (760) | 2000 (1093) | 950 (510) | 2300 (1260) |
| Specific Gravity, g/cc | 1.90 | 1.80 | 1.50 | 1.09 | 1.27 |
| Viscosity, cP | Paste | Paste | Paste | Paste | Paste |
| No. Components | 1 | 2 | 1 | 1 | 1 |
| Mix Ratio, Powder:Liquid | NA | 2:1 | NA | NA | NA |
| Curing | Air Set, hrs | 2-4 | 5-7 | NA | 1-2 |
| | Heat Cure, °F/hrs | 200 / 3-4 | 160 / 1-2 | 400 / 1 or 225 / 6 | 200 / 1 |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 |
| Storage, °F | 40-90 | 40-90 | 40-90 | 40-90 | 40-90 |
| Packaging | Pint, Quart, Gallon, 5-Gallon | Pint, Quart, Gallon, 5-Gallon | Pint, Quart, Gallon, 5-Gallon | 11 oz. Tube | 11 oz. Tube, Pint, Quart, Gallon, 5-Gallon |

APPLICATION PROCEDURES

Surface Preparation

All surfaces must be free of oil, grease, dirt, corrosives or other contaminants before application. Porous metal castings should be baked at high temperature to burn off embedded oils. Smooth metal surfaces should be abrasive blasted with a coarse media to a minimum SP-10 near white blast (0.001" minimum profile) for best results.

Mixing

All products should be mixed thoroughly to a uniform consistency prior to use. Product viscosities may be reduced by adding a maximum of 5–10% by weight of the appropriate thinner. Thinner may be ordered by adding a "T" to the product number (eg. 653-T). The mix ratio for Pyro-Putty® 1000 is 2.0 parts powder to 1.0–1.5 parts liquid by weight. This ratio will produce the consistency of a thick paste. Pyro-Putty® 1000 will outgas slightly after mixing and it is recommended that the mixture be limited to the amount required for a specific application. Store mixed material at room temperature in a plastic container that is approximately twice the mixture volume. Allow to outgas for 24 hours. Remix contents thoroughly prior to use. Note that mixture will not begin to harden in a closed container for over 24 hours. Hardening will initiate when mixture is removed from container and exposed to air.

Application

Pyro-Putty® products may be applied using a spatula, putty knife or caulk gun. For cross-sections greater than $\frac{1}{8}$ "– $\frac{1}{4}$ " multiple applications should be made to avoid blistering. Cross-sections for all products should not exceed $\frac{1}{2}$ "– $\frac{3}{4}$ " ($\frac{3}{8}$ " maximum for Pyro-Putty® 2400).

Curing

The following instructions are guidelines for curing. Alternative cure times may be appropriate depending on the size of the application.

Pyro-Putty® 653

1. Air dry for 2 hours at room temperature and up to 4 hours for thick cross-sections.
2. Heat cure at 200 °F for 3 hours.
3. For multiple applications, air set for 1–2 hours between coats, then heat cure at 200 °F for 3–4 hours after the last coat.

Pyro-Putty® 950

1. This product can be cured in service at the operating temperature of the equipment.
2. For curing before service, heat cure the joint without pressure at 400 °F for 30–60 minutes or 225 °F for 4–6 hours.

Pyro-Putty® 1000

1. A heat cure is not required for cross-sections less than $\frac{1}{8}$ " thick. Air dry at room temperature for a minimum of 2–4 hours prior to use.
2. A heat cure is recommended for cross-sections greater than $\frac{1}{8}$ " thick. Air dry at room temperature for a minimum of 2–4 hours, then heat cure at 160 °F for 1–2 hours.
3. After curing, this product can be sanded to achieve a dull aluminum appearance.



Pyro-Putty® 1000 bonds heater.



Pyro-Putty® 2400 seals high temp ducting.



Pyro-Putty® 2400 seals high temp threads.

Pyro-Putty® 1500

1. This product dries at room temperature and cures in service at the operating temperature of the equipment.

Pyro-Putty® 2400

1. Air dry at room temperature for a minimum of 5–7 hours, longer for thick cross-sections.
2. A heat cure is not required if the use temperature exceeds 400 °F. Otherwise, heat cure at 200 °F for 2–4 hours.

Storage

Unopened containers have a six month shelf life when stored at room temperature. Make sure opened containers are capped securely to prevent evaporation. Place a plastic film in between the cap and container to prevent air leakage. The container may be inverted periodically to minimize settling. Store container between 40 °F and 90 °F.

Safety

Read Material Safety Data Sheet carefully before using any of the above products. Prolonged skin contact should be avoided due to possible irritation. In the uncured state, materials can be washed from the skin with a mild soap and water. If any material contacts eyes, flush continuously with water or neutralizing solutions, then consult a physician immediately.

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

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 | 578 ³ | 576-N | 675-N | 584 | 905 ³ | 905-FG ³ | 673-N | 646-N | 505-N | 586 |
|---------------------------------------|------------------------------------|----------------------------------|-----------------------------------|------------------|-----------------------------------|-----------------------------------|------------------|---------------------|---------------------|-----------------------------------|-----------------------------------|----------------------------------|-----------------------------------|
| Major Constituent | Aluminum Oxide | | | | | Aluminum Nitride | Magnesium Oxide | Fused Silica | | Silicon Carbide | Zirconium Oxide | Zirconium Silicate | |
| Binder | CaO-Al ₂ O ₃ | K ₂ -SiO ₂ | MgO-P ₂ O ₅ | Silicone | MgO-P ₂ O ₅ | MgO-P ₂ O ₅ | SiO ₂ | Silicone | | MgO-P ₂ O ₅ | MgO-P ₂ O ₅ | K ₂ -SiO ₂ | MgO-P ₂ O ₅ |
| Temperature Limit, °F (°C) | 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) |
| CTE, in/in/°F × 10 ⁻⁶ (°C) | 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) |
| Volume Resistivity, ohm-cm @ RT | 10 ⁹ | 10 ⁹ | 10 ⁹ | 10 ¹¹ | 10 ⁹ | 10 ¹³ | 10 ⁹ | 10 ¹¹ | 10 ¹¹ | NA | 10 ⁹ | 10 ⁹ | 10 ⁹ |
| Dielectric Strength, volts/mil @ RT | 75 | 250 | 150 | > 250 | 150 | 300 | 100 | > 250 | > 250 | NA | 250 | 100 | 125 |
| Compressive Strength, psi | 8,000 | 11,000 | 11,800 | NM | 10,200 | 2,000 | 4,500 | NM | NM | 5,000 | 11,500 | 12,800 | 8,000 |
| Porosity, % | < 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 |
| pH | 3–4 | 11–12 | 2–3 | NM | 2–3 | 2–3 | 11–12 | NM | NM | 2–3 | 2–3 | 10–11 | 2–3 |
| Moisture Resistance | Good | Good | Good | Excellent | Good | Good | Good | Excellent | Excellent | Good | Good | Excellent | Good |
| Alkali Resistance | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| Acid Resistance ¹ | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good | Good |
| No. Components | 1 + H ₂ O | 1 + H ₂ O | 1 + H ₂ O ² | 2 | 1 + H ₂ O ² | 1 + H ₂ O ² | 2 | 2 | 2 | 1 + H ₂ O ² | 1 + H ₂ O ² | 1 + H ₂ O | 1 + H ₂ O ² |
| Mix Ratio, powder:liquid | 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 |
| Mixed Viscosity, cP | 12,000 | 10,000 | 11,000 | Paste | 9,000 | 15,000 | 18,000 | Paste | Paste | 12,000 | 9,000 | 10,000 | 15,000 |
| Shrinkage, % at 1000 °F | < 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 |
| Pot Life, hrs | 2–3 | 2–3 | 1–2 | NA | 1–2 | 1–2 | < 10 mins | NA | NA | 1–2 | 1–2 | 1–2 | 1–2 |
| Shelf Life, months | 12 | 12 | 12 | 12 | 12 | 12 | 1 | 905-L:6 905-P:12 | 12 | 12 | 12 | 12 | 12 |
| Color | Light Gray | White | White | White | White | Light Gray | Off-White | Off-White | White | Gray | Tan | Off-White | Off-White |
| Approximate Density, lbs/gal | 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

¹ All products are attacked by hydrofluoric acid.

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

³ 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 ₂ O | 11 | 13 |
| 510 | 100 | H ₂ O | 15 | 19 |
| 515 | 100 | H ₂ O | 12 | 14 |
| 575-N | 100 | H ₂ O, HLB-1 | 13 | 15 |
| 576-N | 100 | H ₂ O, HLB-1 | 12 | 14 |
| 578 | 100 | 578-L | 40 | 45 |
| 584 | 100 | 584-L | 25 | 30 |
| 586 | 100 | H ₂ O, HLB-1 | 13 | 15 |
| 646-N | 100 | H ₂ O, HLB-1 | 12 | 14 |
| 673-N | 100 | H ₂ O, HLB-1 | 13 | 14 |
| 675-N | 100 | H ₂ 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 $\frac{3}{8}$ " – $\frac{1}{2}$ " 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.

Aremco Products makes no warranty express or implied concerning the use of this product.

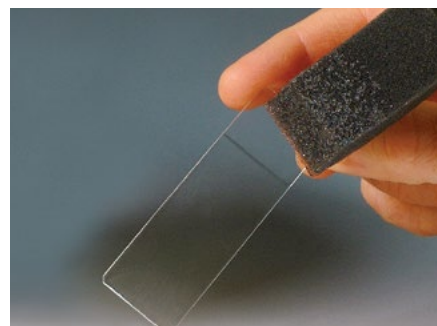
The user assumes all risk of use or handling whether or not in accordance with directions or suggestions, or used singly or in combination with other products.



Corr-Paint™ CP4050-S1 insulates induction heating coil.



Ceramacoat™ 512-N insulates circuit breaker terminal.



Aremco-Seal™ 529 transparent high temp sealer.

PRODUCT HIGHLIGHTS

Ceramic

512-N

Viscous, off-white, electrical insulation paste for circuit breakers, power resistors and solenoids to 2400 °F (1316 °C).

540

Medium viscosity, chromium oxide green, phosphate-bonded, high strength, electrical insulation coating for applications to 3000 °F (1650 °C).

Silicone Resin

529

Transparent silicone sealers with exceptional electrical and moisture resistance to 800 °F (427 °C). Available in low (529), medium (529-HV) and high viscosity (529-VHV) systems.

CP4040-S1

Low viscosity, white coating for sealing high temperature electrical wire insulation up to 1100 °F (593 °C).

CP4050-S1

Low viscosity, green coating for electrically isolating copper induction coils up to 1100 °F (593 °C).

Silicone-Emulsion

CP4000-FB

Low-viscosity black coating for sealing ceramic fiber boards to prevent dusting up to 1100 °F (593 °C). Additional colors available upon request.

CP4055

Chrome oxide green, electrical insulation coating for use on power resistors for applications to 1100 °F (593 °C).

Silicone-Glass-Ceramic

SGC4000

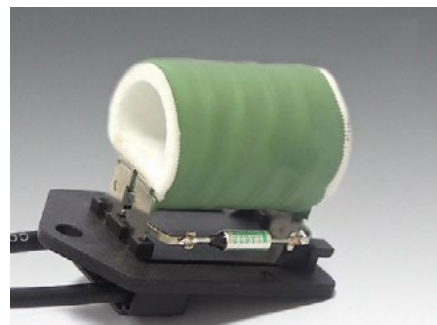
Silicone-glass-ceramic, gray, low viscosity, corrosion, flame, and scratch resistant coating 900 °F (482 °C).

SGC4000-HT

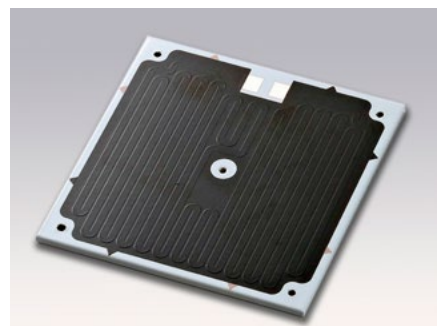
Silicone-glass-ceramic, gray, low viscosity, corrosion, flame, and scratch resistant coating 1400 °F (760 °C).



Cerama-Dip™ 540 coats high power resistor.



Cerama-Dip™ 540 coats high power resistor.



Glass-Coat™ SGC4000 applied to thick-film heater.

HIGH TEMPERATURE SPECIALIZED COATINGS & SEALANTS

| Type | CERAMIC | | SILICONE RESIN | | | | |
|---|------------------------------------|------------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Product Number | 512-N | 540 | 529 | 529-HV | 529-VHV | CP4040-S1 | CP4050-S1 |
| Tradename | Ceramacoat™ | Cerama-Dip™ | Aremco-Seal™ | Aremco-Seal™ | Aremco-Seal™ | Corr-Paint™ | Corr-Paint™ |
| Color (cured) | Off-White | Green | Clear | Clear | Clear | White | Green |
| Maximum Temperature, °F (°C) | 2400 (1316) | 3000 (1650) | 800 (427) | 800 (427) | 800 (427) | 1100 (593) | 1100 (593) |
| No. Components | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | 60,000–80,000 | 15,000–25,000 | 50–250 | 1,200–1,600 | 12,000–14,000 | 250–500 | 300–500 |
| Specific Gravity, g/cc | 1.98 | 2.22 | 1.05 | 1.09 | 1.22 | 1.34 | 1.36 |
| Dielectric Breakdown Strength, VDC/mil | 160 | 70 | > 335 | > 430 | > 375 | 833 | 1250 |
| Solids by Weight, % | 75.9 | 75.0 | 68.0 | 74.9 | 80.0 | 57.1 | 57.1 |
| Solids by Volume, % | 55.0 | 48.9 | 60.9 | 69.0 | 75.3 | 44.4 | 44.4 |
| WFT, mils (microns) ² | 1.82 (46.2) | 2.05 (52.0) | 1.64 (41.7) | 1.45 (36.8) | 1.33 (33.7) | 2.3 (57.2) | 2.3 (57.2) |
| DFT, mils (microns) ³ | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 882 (21.6) | 784 (19.2) | 976 (24.0) | 1106 (27.2) | 1208 (29.6) | 712 (17.5) | 712 (17.5) |
| Curing, Min Air Set, hrs ⁵ | 2–4 | 1.0 | 0.5–1.0 | 0.5–1.0 | 0.5–1.0 | 1.0 | 1.0 |
| Curing, Heat Cure, °F, hrs | 200, 2–4 + 350, 1–2 + 500, 1 | 200, 1–2 + 350, 1–2 + 500, 1 | 200, 0.5–1 + 480, 0.75–1 | 200, 0.5–1 + 480, 0.75–1 | 200, 0.5–1 + 480, 0.75–1 | 200, 0.5–1 + 480, 0.75–1 | 200, 0.5–1 + 480, 0.75–1 |
| Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 |
| Thinner | 512-N-T | 540-T | MEK | MEK | MEK | PM Acetate | PM Acetate |
| Flash Point, °F/°C | NA | NA | 77 (25) | 82 (28) | 86 (30) | ~118 (48) | ~118 (48) |
| Volatiles, lbs/gal | 0.00 | 0.00 | 2.80 | 2.28 | 2.00 | 4.80 | 4.80 |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 55–85 | 55–85 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

¹ Viscosity is measured using a Brookfield LV Viscometer; spindle and speed selection vary depending on the product.

² Estimated Wet Film Thickness (WFT).

³ Recommended Dry Film Thickness (DFT).

⁴ Actual coverage will vary depending on material losses during mixing and application.

⁵ Where a value is provided for "Min Air Set", it is recommended to set the coating at room temperature for, at minimum, the specified time prior to curing.

Abbreviations

NA Not Applicable
 NR Not Required
 DFT Dry Film Thickness
 WFT Wet Film Thickness

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Quartz should be etched and/or sandblasted whenever possible. Smooth metal surfaces should be sandblasted or etched using Aremco's Corr-Prep™ CPR2000.

HIGH TEMPERATURE SPECIALIZED COATINGS & SEALANTS

| Type | SILICONE EMULSION | | SILICONE-GLASS-CERAMIC | |
|---|-----------------------------|-----------------------------|--|--|
| Product Number | CP4000-FB | CP4055 | SGC4000 | SGC4000-HT |
| Tradename | Corr-Paint™ | Corr-Paint™ | Glass-Coat™ | Glass-Coat™ |
| Color (cured) | Black | Green | Light Gray | Black |
| Maximum Temperature, °F (°C) | 1100 (593) | 1100 (593) | 900 (482) | 1400 (760) |
| No. Components | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | 150–300 | 500–1,000 | 40–80 | 900–1200 |
| Specific Gravity, g/cc | 1.30 | 1.35 | 1.59 | 1.61 |
| Dielectric Breakdown Strength, VDC/mil | NA | 700 | 1,000 | 1,000 |
| Solids by Weight, % | 55.0 | 55.0 | 74.0 | 79.0 |
| Solids by Volume, % | 40.2 | 38.1 | 55.5 | 53.6 |
| WFT, mils (microns) ² | 1.82 (46.2) | 2.62 (66.6) | 1.80 (45.8) | 1.87 (47.4) |
| DFT, mils (microns) ³ | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 882 (21.7) | 612 (15.0) | 890 (21.8) | 860 (21.1) |
| Curing, Min Air Set, hrs ⁵ | 1.0 | 1.0 | 0.25 | 0.25 |
| Curing, Heat Cure, °F, hrs | 200, 0.5–1 + 480, 0.75–1 | 200, 0.5–1 + 480, 0.75–1 | 200, 0.25 + 480, 0.25 + 1000, 0.20 | 200, 0.25 + 480, 0.25 + 1000, 0.20 |
| Application Temperature, °F | 50–120 | 50–120 | 50–120 | 50–120 |
| Thinner | Distilled Water | Distilled Water | Ethanol | PM Acetate |
| Flash Point, °F/°C | > 212 (100) | > 212 (100) | 96 (36) | 115 (46) |
| Volatiles, lbs/gal | 0.65 | 0.67 | 3.50 | 3.90 |
| Shelf Life, months | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 55–85 | 55–85 | 40–90 | 40–90 |

Reference Notes

¹ Viscosity is measured using a Brookfield LV Viscometer; spindle and speed selection vary depending on the product.

² Estimated Wet Film Thickness (WFT).

³ Recommended Dry Film Thickness (DFT).

⁴ Actual coverage will vary depending on material losses during mixing and application.

⁵ Where a value is provided for "Min Air Set", it is recommended to set the coating at room temperature for, at minimum, the specified time prior to curing.

Abbreviations

NA Not Applicable
 NR Not Required
 DFT Dry Film Thickness
 WFT Wet Film Thickness

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Quartz should be etched and/or sandblasted whenever possible. Smooth metal surfaces should be sandblasted or etched using Aremco's Corr-Prep™ CPR2000.

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PRODUCT HIGHLIGHTS

Aremco's HiE-Coat™ 840-Series line of high emissivity coatings are black-body formulations designed to significantly improve the thermal efficiency of infrared heaters, furnaces, incinerators, and ovens used throughout the appliance, ceramics, chemical processing, metallurgical, and refining industries. Natural gas and oil savings in the range of 5–10% are typical using these coatings.

840-C Ceramic-based, black-pigmented coating for ceramic fiber modules, light-weight refractory board, and dense refractories to 2000 °F (1093 °C).

840-CX Ceramic-based, black-pigmented coating for ceramic fiber modules, light-weight refractory board, and dense refractories to 2400 °F (1316 °C).

840-CM Ceramic-based, black-pigmented coating for dense refractories and refractory metals to 2000 °F (1093 °C).

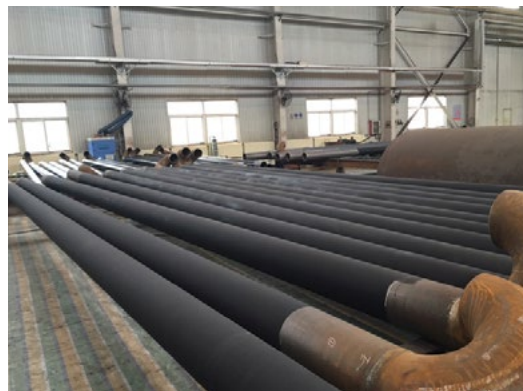
840-CMX Ceramic-based, black-pigmented coating for dense refractories and refractory metals to 2400 °F (1316 °C).

840-M Ceramic-based, black pigmented coating for carbon and stainless steel to 2000 °F (1093 °C).

840-MX Ceramic-based, black pigmented coating for carbon and stainless steel to 2400 °F (1316 °C).

840-MS Silicone-Ceramic, black pigmented coating for aluminum, copper, carbon and stainless steel to 1100 °F (593 °C).

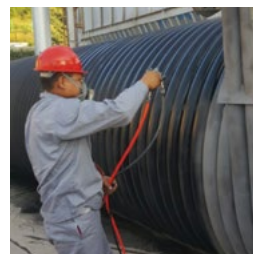
High emissivity coatings absorb and re-radiate significantly more radiant and convective heat than an uncoated burner tube or refractory to a cooler load. For refractories lined systems, this reduces the amount of heat stored in the lining which results in less thermal shock and related thermal stresses, resulting in longer refractory life and reduced maintenance costs. Since less energy is absorbed by the refractory lining, faster heat-ups result, reducing cycle time and energy costs.



HiE-Coat™ 840-M coats gas-fired heating tubes.



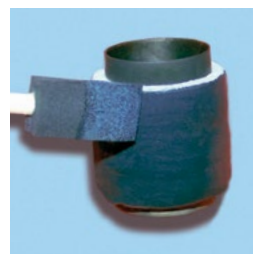
HiE-Coat™ 840-C coats ceramic fiberboard infrared heater.



HiE-Coat™ 840-M coats industrial heat exchanger.



HiE-Coat™ 840-M coats gas burner component.



HiE-Coat™ 840-C coats exhaust pipe insulation.

HIE-COAT™ HIGH EMISSIVITY COATINGS

| Product Number | 840-C | 840-CX ⁶ | 840-CM | 840-CMX ⁶ | 840-M | 840-MX ⁶ | 840-MS |
|---|-------------------------|-------------------------|-----------------------|-----------------------|---------------------|---------------------|--------------------------|
| Type | Inorganic-Ceramic | | | | | | Silicone-Ceramic |
| Applications | Light-Weight Refractory | Light-Weight Refractory | Dense Refractory | Dense Refractory | Carbon Steel | Carbon Steel | Aluminum |
| | Fiber Modules | Fiber Modules | Refractory Metals | Refractory Metals | Stainless Steel | Stainless Steel | Copper |
| | Dense Refractory | Dense Refractory | | | | | Carbon & Stainless Steel |
| Color (cured) | Jet Black | Jet Black | Jet Black | Jet Black | Jet Black | Jet Black | Jet Black |
| Maximum Temperature, °F (°C) | 2000 (1093) | 2400 (1316) | 2000 (1093) | 2400 (1316) | 2000 (1093) | 2400 (1316) | 1100 (593) |
| No. Components | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | 70–160 | 50–150 | 600–800 | 150–300 | 400–800 | 300–700 | 250–500 |
| Specific Gravity, g/cc | 1.60 | 1.52 | 1.54 | 1.67 | 1.61 | 1.57 | 1.49 |
| Solids by Weight, % | 58.5 | 51.5 | 48.0 | 51.0 | 47.3 | 47.3 | 57.1 |
| Solids by Volume, % | 27.3 | 20.25 | 19.9 | 22.4 | 22.1 | 22.1 | 42.5 |
| WFT, mils (microns) ² | 3.66 (92.9) | 4.94 (125.4) | 5.03 (127.7) | 4.46 (113.4) | 4.52 (114.8) | 4.52 (114.8) | 2.40 (61.0) |
| DFT, mils (microns) ³ | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.00 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 438 (10.8) | 325 (8.0) | 319 (7.8) | 359 (8.8) | 355 (8.7) | 355 (8.7) | 681 (16.7) |
| Curing, Min Air Set, hrs ⁵ | 1.0–2.0 | 1.0–2.0 | 1.0 | 1.0–2.0 | 1.0 | 1.0 | 1.0 |
| Curing, Heat Cure, °F, hrs | 200, 1 | 200, 1 | 200, 0.5 + 500 / 1 | 200, 0.5 + 500 / 1 | 200, 1 + 500 / 1 | 200, 1 + 500 / 1 | 480 / .75 |
| Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–120 |
| Thinner | 840-C-T | 840-CX-T | 840-CM-T | 840-CM-T | 840-M-T | 840-MX-T | PM Acetate |
| Flash Point, °F/°C | NA | NA | NA | NA | NA | NA | ~118 (48) |
| Volatiles, lbs/gal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.3 |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 40–90 |

Reference Notes

- ¹ Viscosity is measured using a Brookfield LV Viscometer; spindle and speed selection vary depending on the product.
- ² Estimated Wet Film Thickness (WFT).
- ³ Recommended Dry Film Thickness (DFT).
- ⁴ Actual coverage will vary depending on material losses during mixing and application.
- ⁵ Where a value is provided for "Min Air Set", it is recommended to set the coating at room temperature for, at minimum, the specified time prior to curing.
- ⁶ Part numbers ending in "X" are made with black pigment that does not contain any copper; copper can produce "greening" of the coating when exposed to flame impingement.

Surface Preparation Notes

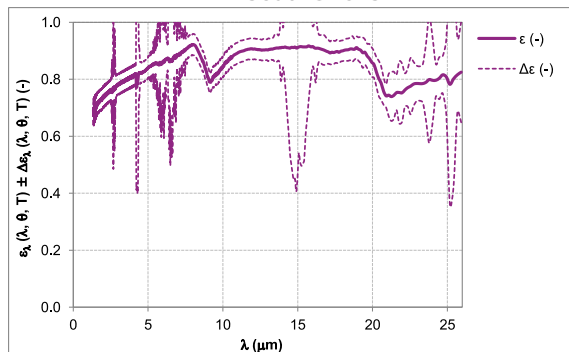
All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Quartz should be etched or sandblasted whenever possible. Smooth metal surfaces should be sandblasted or etched using Aremco's Corr-Prep™ CPR2000.

Abbreviations

| | | | |
|----|----------------|-----|--------------------|
| NA | Not Applicable | DFT | Dry Film Thickness |
| NR | Not Required | WFT | Wet Film Thickness |

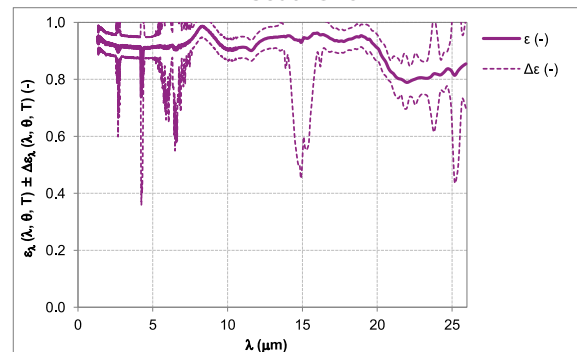
Spectral Normal Emissivity at 800 °C

HIE-Coat™ 840-C



| λ (μm) | 2 | 3.5 | 4.7 | 8.3 | 10 | 12.5 | 17.5 | 20 | 25 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ε _λ (λ, θ, T) (-) | 0.735 | 0.799 | 0.827 | 0.903 | 0.848 | 0.904 | 0.896 | 0.860 | 0.809 |
| Δε (-), k = 2 | 0.036 | 0.036 | 0.036 | 0.037 | 0.035 | 0.036 | 0.042 | 0.051 | 0.066 |

HiE-Coat™ 840-M



| λ (μm) | 2 | 3.5 | 4.7 | 8.3 | 10 | 12.5 | 17.5 | 20 | 25 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ε _λ (λ, θ, T) (-) | 0.924 | 0.915 | 0.911 | 0.986 | 0.906 | 0.943 | 0.934 | 0.913 | 0.832 |
| Δε (-), k = 2 | 0.038 | 0.037 | 0.037 | 0.039 | 0.037 | 0.037 | 0.041 | 0.047 | 0.062 |

For more Spectral Normal Emissivity Charts, visit aremco.com/tech-notes

Refer to Price List for complete order information.

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HiE-Coat™ 840-M, 840-MS & 840-MX Metal Tube Coatings

This series of high emissivity coatings is available for maximizing the thermal efficiency of radiant heater process tubes. These coatings help to limit scale formation thereby improving the thermal conductivity of the tubes and radiant heat output. Tube scale causes a significant drop in thermal conductivity requiring additional energy input to maintain the same production rate. HiE-Coat™ metal coatings applied in a dry film thickness of 2–3 mils helps to significantly reduce oxidation and corrosion of the metal tube.

High Emissivity Coating Benefits for Refractory-Lined Furnaces

- Improved Thermal Conductivity
- Increased Production Rate
- Decreased Fuel Consumption
- More Uniform Tube Wall Temperature
- Longer Tube Life
- Lower Emissions

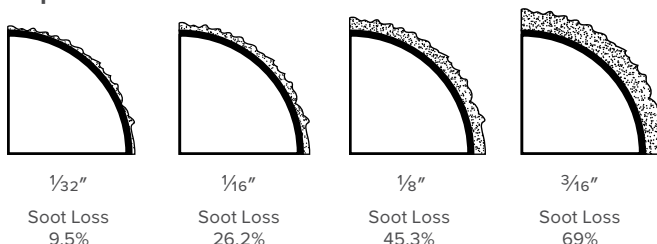


HiE-Coat™ 840-M coats industrial heat exchanger.



HiE-Coat™ 840-M coats gas-fired heating tubes.

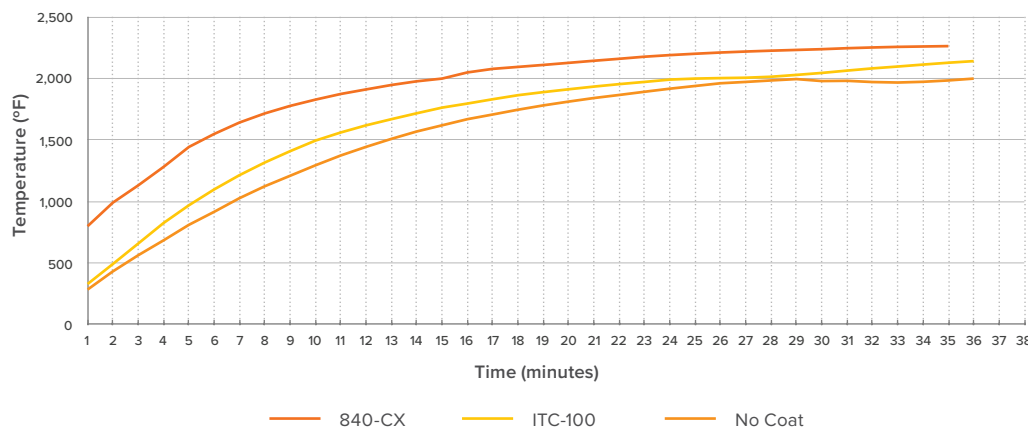
Effect of soot buildup on thermal conductivity of process tubes



Case Study

HiE-Coat™ 840-CX was applied to a specialty propane gas forge that was properly designed and well insulated to limit heat losses. The ramp up temperature was compared to both uncoated refractory and refractory coated using a competitor's product called ITC-100. It was found that the 840-CX helped to achieve a 200 °F higher forging temperature in one-half the time.

Forge Ramp Speed



HiE-Coat™ 840-CX applied to a gas-fired forge.

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HIE-COAT™ HIGH EMISSIVITY COATINGS

| Product Number | 840-C | 840-CX ⁶ | 840-CM | 840-M | 840-MX ⁶ | 840-MS |
|---|-------------------------|-------------------------|-----------------------|---------------------|---------------------|--------------------------|
| Type | Inorganic-Ceramic | | | | | Silicone-Ceramic |
| Applications | Light-Weight Refractory | Light-Weight Refractory | Dense Refractory | Carbon Steel | Carbon Steel | Aluminum |
| | Fiber Modules | Fiber Modules | Refractory Metals | Stainless Steel | Stainless Steel | Copper |
| | Dense Refractory | Dense Refractory | | | | Carbon & Stainless Steel |
| Color (cured) | Jet Black | Jet Black | Jet Black | Jet Black | Jet Black | Jet Black |
| Maximum Temperature, °F (°C) | 2000 (1093) | 2400 (1316) | 2000 (1093) | 2000 (1093) | 2400 (1316) | 1100 (593) |
| No. Components | 1 | 1 | 1 | 1 | 1 | 1 |
| Mix Ratio, by Weight (by Volume) | NA | NA | NA | NA | NA | NA |
| Viscosity, cP ¹ | 70–160 | 50–150 | 600–800 | 400–800 | 300–700 | 250–500 |
| Specific Gravity, g/cc | 1.60 | 1.52 | 1.54 | 1.61 | 1.57 | 1.49 |
| Solids by Weight, % | 58.5 | 51.5 | 48.0 | 47.3 | 47.3 | 57.1 |
| Solids by Volume, % | 27.3 | 20.25 | 19.9 | 22.1 | 22.1 | 42.5 |
| WFT, mils (microns) ² | 3.66 (92.9) | 4.94 (125.4) | 5.03 (127.7) | 4.52 (114.8) | 4.52 (114.8) | 2.40 (61.0) |
| DFT, mils (microns) ³ | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.00 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 438 (10.8) | 325 (8.0) | 319 (7.8) | 355 (8.7) | 355 (8.7) | 681 (16.7) |
| Curing, Min Air Set, hrs ⁵ | 1.0–2.0 | 1.0–2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Curing, Heat Cure, °F, hrs | 200, 1 | 200, 1 | 200, 0.5 + 500 / 1 | 200, 1 + 500 / 1 | 200, 1 + 500 / 1 | 480 / .75 |
| Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–120 |
| Thinner | 840-C-T | 840-CX-T | 840-CM-T | 840-M-T | 840-MX-T | PM Acetate |
| Flash Point, °F/°C | NA | NA | NA | NA | NA | ~118 (48) |
| Volatiles, lbs/gal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.3 |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 40–90 |

Reference Notes

- ¹ Viscosity is measured using a Brookfield LV Viscometer; spindle and speed selection vary depending on the product.
- ² Estimated Wet Film Thickness (WFT).
- ³ Recommended Dry Film Thickness (DFT).
- ⁴ Actual coverage will vary depending on material losses during mixing and application.
- ⁵ Where a value is provided for "Min Air Set", it is recommended to set the coating at room temperature for, at minimum, the specified time prior to curing.
- ⁶ Part numbers ending in "X" are made with black pigment that does not contain any copper; copper can produce "greening" of the coating when exposed to flame impingement.

Surface Preparation Notes

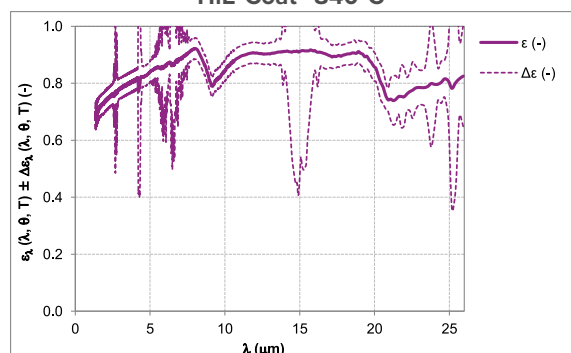
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Abbreviations

| | | | |
|----|----------------|-----|--------------------|
| NA | Not Applicable | DFT | Dry Film Thickness |
| NR | Not Required | WFT | Wet Film Thickness |

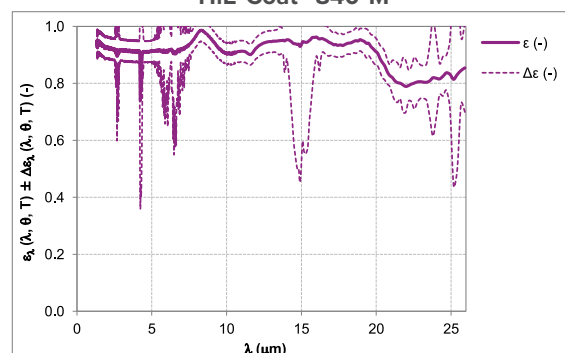
Spectral Normal Emissivity at 800 °C

HIE-Coat™ 840-C



| λ (μm) | 2 | 3.5 | 4.7 | 8.3 | 10 | 12.5 | 17.5 | 20 | 25 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ε _λ (λ, θ, T) (-) | 0.735 | 0.799 | 0.827 | 0.903 | 0.848 | 0.904 | 0.896 | 0.860 | 0.809 |
| Δε (-), k = 2 | 0.036 | 0.036 | 0.036 | 0.037 | 0.035 | 0.036 | 0.042 | 0.051 | 0.066 |

HIE-Coat™ 840-M



| λ (μm) | 2 | 3.5 | 4.7 | 8.3 | 10 | 12.5 | 17.5 | 20 | 25 |
|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ε _λ (λ, θ, T) (-) | 0.924 | 0.915 | 0.911 | 0.986 | 0.906 | 0.943 | 0.934 | 0.913 | 0.832 |
| Δε (-), k = 2 | 0.038 | 0.037 | 0.037 | 0.039 | 0.037 | 0.037 | 0.041 | 0.047 | 0.062 |

For more Spectral Normal Emissivity Charts, visit aremco.com/tech-notes

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PRODUCT HIGHLIGHTS

542 Single part, ultra-low viscosity, water-dispersed, inorganic, aluminum phosphate solution for penetrating ultra-fine porosity applications 3000 °F (1650 °C).

503-VFG-C Single part, alumina-filled, water-dispersed, phosphate-bonded, highly abrasion and corrosion resistant sealer for applications to 3000 °F (1650 °C). Available in many standard colors.

| | |
|---------------|--------|
| 503-VFG-C-WHT | White |
| 503-VFG-C-BLK | Black |
| 503-VFG-C-BLU | Blue |
| 503-VFG-C-RED | Red |
| 503-VFG-C-ORG | Orange |

634-ZOS Single part, zirconium oxide sealer produces a hard, oxidation resistant coating for applications to 3000 °F (1650 °C).

CP2000 Single part, urethane-based, gloss black, low viscosity, room temperature curing, abrasion and corrosion resistant sealer for applications to 400 °F (204 °C).

CP2040 Single part, ultra-low viscosity, fast-curing, corrosion resistant, clear phenolic sealer for impregnating micropores and cracks as fine as 0.0005" for applications to 400 °F (204 °C).

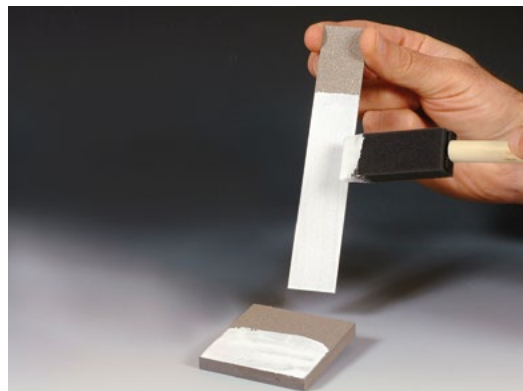
CP2080 Two-part, medium viscosity, clear Novolac-epoxy with exceptional abrasion and corrosion resistance for continuous operations to 300 °F (150 °C) and intermittent use to 400 °F (204 °C).

CP2090 Two-part, low viscosity, room temperature curing, epoxy sealer for continuous applications to 400 °F (204 °C).

CP4010-S1-LV Single part, low viscosity, aluminum-rich, heat-curable, silicone sealer offering exceptional outdoor weathering resistance to 1100 °F (593 °C).

CP40XX-S2-HT Single part, low viscosity, room temperature curing, flame resistant, dielectric, silicone-glass-ceramic sealer offering continuous temperature resistance to 1500 °F (816 °C) and intermittent resistance to 1800 °F (982 °C).

| | |
|--------------|-------------|
| CP4000-S2-HT | Black |
| CP4020-S2-HT | Navy Gray |
| CP4040-S2-HT | Navy White |
| CP4080-S3-HT | Navy Yellow |



Ceramacoat™ 503-VFG-C-WHT applied to thermal spray substrate.



Ceramabind™ 542 seals thermal spray on sensor.



CP2000 seals thermal spray on small heater.



CP2000 seals thermal spray on motor housing.

HIGH TEMPERATURE THERMAL SPRAY SEALANTS

| Product Number | 542 | 503-VFG-C ⁶ | 634-ZOS | CP2000 | CP2040 | CP2080 | CP2090 | CP4010-S1-LV | CP4000-S2-HT ⁷ |
|---|-----------------------------|-----------------------------|-----------------------------|-----------------|-------------|----------------|----------------|--------------|---------------------------|
| Tradename | Ceramabind™ | Ceramacoat™ | | | | Corr-Paint™ | | | |
| Type | | Inorganic | | Urethane | Phenolic | Novolac-Epoxy | | Silicone | |
| Color (cured) | Clear | White | Off-White | Gloss Black | Clear | Clear | Amber | Aluminum | Black |
| Maximum Temperature, °F (°C) | 3000 (1650) | 3000 (1650) | 3000 (1650) | 400 (204) | 400 (204) | 400 (204) | 300 (150) | 1100 (593) | 1800 (982) |
| No. Components | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 |
| Mix Ratio, by Weight (by Volume) | NA | NA | NA | NA | NA | 100:40 (2:1) | 4:4:25 | NA | NA |
| Viscosity, cP ¹ | 35–45 | 5,000–7,000 | 500–1,500 | 200–240 | 5–15 | 600–1000 | 100–200 | 100–150 | 150–500 |
| Specific Gravity, g/cc | 1.47 | 2.34 | 2.00 | 1.05 | 0.87 | 1.10 | 1.10 | 0.99 | 1.50 |
| Solids by Weight, % | 41.0 | 76.0 | 64.8 | 67.0 | 10.0 | 100.0 | 100.0 | 23.9 | 73.0 |
| Solids by Volume, % | 22.0 | 53.7 | 30.6 | 49.0 | 21.0 | 100.0 | 100.0 | 17.1 | 70.0 |
| WFT, mils (microns) ² | 4.54 (115.3) | 1.86 (47.3) | 3.27 (83.1) | 2.00 (50.5) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 5.8 (14850) | 1.43 (36.3) |
| DFT, mils (microns) ³ | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 0.16 (4.1) | 1.00 (25.4) | 1.00 (25.4) | 1.0 (25.4) | 1.00 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 353 (8.7) | 861 (21.1) | 490 (12.0) | 722 (17.7) | 260 (6.4) | 1604 (39.3) | 1604 (39.3) | 274 (6.7) | 1122 (27.5) |
| Curing, Min Air Set, hrs ⁵ | 1.0–2.0 | 1.0–2.0 | 1.0–2.0 | 0.5 | 0.5 | 8.0 | 1.0 | 1.0 | 1.0 |
| Curing, Heat Cure, °F, hrs | 200/1 + 500/1 + 700/1 | 200/1 + 500/1 + 700/1 | 200/2 + 350/1 + 500/1 | RT/24 or 250/1 | 300/15 | RT/24 or 150/2 | RT/48 or 150/3 | 480/0.75 | RT/24–48 |
| Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–120 | 50–90 |
| Thinner | Water | 503-T, Water | 634-ZOS-T, Water | Hi-Flash Naptha | n-Butanol | Xylene | Xylene | PM Acetate | T-Butyl Acetate |
| Flash Point, °F/°C | NA | NA | > 200 (93) | 140 (60) | 73 (23) | > 200 (93) | > 200 (93) | 111 (44) | 117 (47) |
| Volatiles, lbs/gal | 0.00 | 0.00 | 0.05 | 2.86 | 5.74 | 0.0 | 0.0 | 6.6 | 2.3 |
| Shelf Life, months | 6 | 6 | 6 | 12 | 12 | 12 | 12 | 6 | 3 |
| Storage Temperature, °F | 55–85 | 55–85 | 55–85 | 40–80 | 40–50 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

- ¹ Viscosity is measured using a Brookfield LV Viscometer; spindle and speed selection vary depending on the product.
² Estimated Wet Film Thickness (WFT).
³ Recommended Dry Film Thickness (DFT).
⁴ Actual coverage will vary depending on material losses during mixing and application.
⁵ Where a value is provided for “Min Air Set”, it is recommended to set the coating at room temperature for, at minimum, the specified time prior to curing.

Ceramacoat™ 503-VFG-C

- ⁶ Available in the following standard colors:
503-VFG-C-WHT White
503-VFG-C-BLK Black
503-VFG-C-BLU Blue
503-VFG-C-RED Red
503-VFG-C-ORG Orange

Corr-Paint™ CP40XX-S2-HT

- ⁷ Available in the following standard colors:
CP4000-S2-HT Black
CP4020-S2-HT Navy Gray
CP4040-S2-HT Navy White
CP4080-S2-HT Navy Yellow

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Quartz should be sandblasted whenever possible. Smooth metal surfaces should be sandblasted or etched using Aremco's Corr-Prep™ CPR2000.

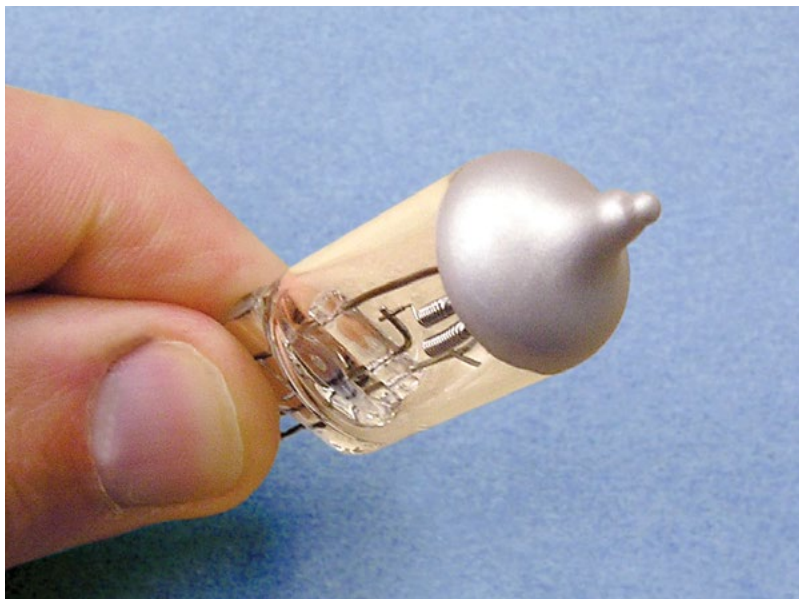
Abbreviations

NA Not Applicable
NR Not Required
DFT Dry Film Thickness
WFT Wet Film Thickness

Refer to Price List for complete order information.

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Lamp-Coat™ LC4010-GL applied to auto headlamp.



Lamp-Coat™ LC4040-SG applied to IR heater.



Ceramacoat™ 845-GLT applied to auto headlamp.

PRODUCT HIGHLIGHTS

Ceramic-Inorganic

845 Single part, waterborne, silicon-filled, phosphate-bonded, brown-black coating for glass and quartz to 2000 °F (1093 °C). Primarily used for marking ceramic parts and coating automotive headlamps, stadium lighting and quartz vessels for the semiconductor industry. Standard viscosity is 200–400 cP; a higher viscosity coating, 845-HV, in the range of 500–800 cP is available upon request. Additional colors below are offered.

845-BLK Jet Black
845-BLU Cobalt Blue
845-GRY Light-Gray
845-GLT Light-Green
845-GDK Dark-Green
845-SIL Silver
845-WHT White

Glass

613 Glass-filled adhesive/sealer for use with porous ceramics and refractories to 1150 °F (620 °C).
617 Glass-filled adhesive/sealer for use with porous ceramics and refractories to 1500 °F (816 °C).
850 Glass-ceramic filled, white reflective coating for glass and quartz to 1500 °F (816 °C).

Silicone

LC4010-BT Aluminum-filled coating for application over black top coated headlamps to 1020 °F (550 °C).
LC4010-GL Aluminum-filled coating for application directly over uncoated headlamps to 1020 °F (550 °C).
LC4040-SG White reflective coating for use on mercury vapor lamps and other high temperature glass and quartz components to 1200 °F (649 °C).



Quartz-Coat™ 850 applied to quartz IR heater tube.

HIGH TEMPERATURE COATINGS FOR CERAMICS, GLASS & QUARTZ

| Type | INORGANIC-CERAMIC | | | | | | | | | GLASS | | | SILICONE | | |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------|-----------------------------------|--------------|----------------------|----------------------|------------------------------------|
| Product Number | 845 | 845-HV | 845-BLK | 845-BLU | 845-GRY | 845-GLT | 845-GDK | 845-SIL | 845-WHT | 613 | 617 | 850 | LC4010-BT | LC4010-GL | LC4040-SG |
| Tradename | Quartz-Coat™ | | Ceramacoat™ | | | | | | | Aremco-Seal™ | | Quartz-Coat™ | Lamp-Coat™ | | |
| Color (cured) | Brown-Black | Brown-Black | Jet Black | Blue | Gray | Light Green | Dark Green | Matte Silver | Off-White | Light Gray | Clear | White | Silver | Silver | White |
| Maximum Temperature, °F (°C) | 2000 (1093) | 2000 (1093) | 1500 (816) | 1500 (816) | 1500 (816) | 1500 (816) | 1500 (816) | 1500 (816) | 1500 (816) | 1150 (620) | 1500 (816) | 1600 (871) | 1020 (550) | 1020 (550) | 1200 (649) |
| No. Components | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | 200–400 | 500–800 | 1,000–1,500 | 500–1,000 | 400–700 | 750–1,250 | 800–1,000 | 400–900 | 400–700 | 1,000–2,000 | 1,100–1,500 | 500–1,000 | 40–50 | 300–400 | 250–500 |
| Specific Gravity, g/cc | 1.44 | 1.51 | 1.66 | 1.64 | 1.65 | 1.66 | 1.67 | 1.46 | 1.83 | 1.39 | 1.45 | 1.84 | 1.07 | 1.05 | 1.70 |
| Solids by Weight, % | 50.1 | 52.8 | 52.9 | 50.9 | 51.8 | 52.9 | 52.9 | 44.4 | 41.3 | 54.0 | 51.3 | 61.3 | 57.0 | 35.8 | 70.9 |
| Solids by Volume, % | 22.9 | 31.9 | 32.0 | 23.6 | 25.2 | 26.7 | 26.7 | 23.1 | 22.9 | 41.6 | 40.5 | 31.4 | 49.5 | 31.9 | 52.7 |
| WFT, mils (microns) ² | 3.24 (82.3) | 3.13 (79.6) | 2.90 (73.8) | 4.24 (107.8) | 3.97 (100.8) | 3.74 (95.0) | 3.74 (95.0) | 4.34 (110.1) | 4.12 (104.6) | 2.40 (61.0) | 2.47 (62.7) | 3.18 (80.8) | 2.02 (51.3) | 3.13 (79.6) | 1.90 (48.2) |
| DFT, mils (microns) ³ | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 495 (12.2) | 512 (12.6) | 552 (13.6) | 378 (9.3) | 404 (9.9) | 429 (10.5) | 429 (10.5) | 370 (9.1) | 389 (9.6) | 668 (16.4) | 650 (15.9) | 504 (12.4) | 794 (19.5) | 512 (12.6) | 845 (20.8) |
| Curing, Min Air Set, min ⁵ | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 30–60 | 30 | 30 | 10 | 5 | 60 |
| Curing, Heat Cure, °F, min ⁶ | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 200, 10 + 900, 5 | 1150, 30 | 200, 30 + 350, 60 + 1830, 1 | 1650, 15 | 200, 15 + 900, 10 | 200, 30 + 900, 10 | 200, 60 + 450, 60 + 1300, 15 |
| Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–120 | 50–120 | 50–120 |
| Thinner | 845-T | 845-T | 845-T | 845-T | 845-T | 845-T | 845-T | 845-T | 845-T | Water | Water | Water | PM Acetate | Ethanol | PM Acetate |
| Flash Point, °F/°C | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | ~ 118 (48) | ~ 118 (48) | ~115 (46) |
| Volatiles, lbs/gal | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.7 | 6.1 | 3.8 |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

- ¹ Viscosity is measured using a Brookfield LV Viscometer; spindle and speed selection vary depending on the product.
- ² Estimated Wet Film Thickness (WFT).
- ³ Recommended Dry Film Thickness (DFT).
- ⁴ Actual coverage will vary depending on material losses during mixing and application.
- ⁵ Where a value is provided for “Min Air Set”, it is recommended that the coating set at room temperature for, at minimum, the specified time prior to curing.
- ⁶ Recommended ramp rate is 10 °F per minute.

Abbreviations

- NA Not Applicable
NR Not Required
DFT Dry Film Thickness
WFT Wet Film Thickness

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Quartz should be sandblasted whenever possible. Smooth metal surfaces should be sandblasted or etched using Aremco's Corr-Prep™ CPR2000.

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco's refractory coatings offer the ultimate protection of high temperature components used in the processing of ceramics, glass, metals, and plastics.

FEATURES

- Ultra Hi-Temp Resistance
- Non-Wetted by Molten Metals, Salts, Glass & Plastics
- High Lubricity for Easy Part Release
- Minimizes Cast Surface Defects
- Increases Mold & Die Life
- For Use in Oxidizing, Reducing & Vacuum Atmospheres

APPLICATIONS

- Composite Forming
- Glass Forming
- Metal Casting
- Injection Molding
- Ceramic Hot-Pressing
- Metal Powder Sintering
- Welding
- Brazing

PRODUCT HIGHLIGHTS

Graphi-Coat™ 623

This patented coating is a two-part, silica-bonded, titanium diboride filled, oxidation resistant coating for protecting graphite crucibles, electrodes, and heat-treating fixtures to 2000 °F (1093 °C).

Pyro-Paint™ 634-AL

This high purity alumina, two-part coating seals alumina fiberboards and shapes to fill porosity and resist molten metals to 3200 °F (1760 °C). Increases heat reflectivity to improve furnace efficiency by reducing ramp up times.

Pyro-Paint™ 634-ALP

This phosphate-bonded, single-part alumina coating bonds exceptionally well to dense refractories, providing high abrasion and corrosion resistance for operating temperatures to 3200 °F (1760 °C).

Pyro-Paint™ 634-AS and 634-AS1

These alumina-silica, single-part coatings increase the durability of refractory fiberboards by sealing the substrate to minimize dusting and resist wetting by non-ferrous metals to 2300 °F (1260 °C).

Pyro-Paint™ 634-BN and 634-BNSC

These lubricious, boron nitride, single-part coatings are used to seal refractory fiberboards and metals from wetting by non-ferrous metals, salts, glasses and plastics. Select 634-BN for hard-coat and 634-BN(SC) for a more consumable soft-coat.

Pyro-Paint™ 634-GR

This single-part graphite coating improves parting of aluminum permanent molds, non-sticking in glass forming, and lubrication and stop-off in metalworking and wire drawing. Provides superior release, surface finish and mold protection.

Pyro-Paint™ 634-SIC

This single-part, silicon carbide coating improves the oxidation resistance of graphite crucibles, electrodes, and heat-treating fixtures to 2550 °F (1400 °C).

Pyro-Paint™ 634-YO

This single-part, yttrium oxide coating protects graphite, ceramic and metals, exposed to reactive metals such as titanium, uranium and their alloys under inert or vacuum atmospheres to 2732 °F (1500 °C).

Pyro-Paint™ 634-ZO

This single-part, zirconium oxide coating produces a hard, oxidation resistant coating on carbon and stainless steel and a range of refractory metals including molybdenum, platinum, rhodium, and titanium to 3270 °F (1800 °C). Good for sealing porous refractories and protecting resistance heating elements from oxidation and residue buildup that causes arcing and reduced element life.



HIGH TEMPERATURE REFRACTORY COATINGS PROPERTIES

| Part Number | 623 | 634-AL | 634-ALP | 634-AS | 634-AS-1 | 634-BN | 634-BNSC | 634-GR | 634-SIC | 634-YO | 634-ZO |
|--|------------------------------|-------------------------|-----------------------|----------------------------|---------------|--|-------------------------|--------------------------------|------------------------------|------------------------|-----------------------------|
| Principal Application | Reduce Oxidation of Graphite | Seal Alumina Fiberboard | Seal Dense Refractory | Seal Refractory Fiberboard | | Resist Wetting of Non-Ferrous Alloys on Refractories | | Resist Wetting of Glass, Metal | Reduce Oxidation of Graphite | Resist Reactive Metals | Prevent Oxidation of Metals |
| Major Constituent | Titanium DiBoride | Aluminum Oxide | | Alumina-Silica | | Boron Nitride | | Graphite | Silicon Carbide | Yttrium Oxide | Zirconium Oxide |
| Color | Gray | White | White | Off-White | White | White | White | Black | Gray | Off-White | Off-White |
| Temperature Limit, °F (°C) | 2000 (1093) | 3200 (1760) | 3200 (1760) | 2300 (1260) | 2300 (1260) | 1560 (850) ¹ | 1560 (850) ¹ | 2200 (1200) | 2550 (1400) | 2732 (1500) | 3270 (1800) |
| No. Components | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Mix Ratio² | 60 : 40 | 75 : 25 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Viscosity, cP | 200–400 | 100–200 | 5,000–7,000 | 500–800 | 10,000–20,000 | 500–1,500 | 10–100 | 100–250 | 750–2,000 | 200–400 | 1,000–2,000 |
| Specific Gravity, g/cc | 2.15 | 2.46 | 2.38 | 1.55 | 1.60 | 1.15 | 1.20 | 1.24 | 2.00 | 1.55 | 2.02 |
| Solids by Weight, % | 78.7 | 81.3 | 76.0 | 64.3 | 64.9 | 19.8 | 30.0 | 47.5 | 68.2 | 45.0 | 59.2 |
| Solids by Volume, % | 52.7 | 56.1 | 53.7 | 41.1 | 40.7 | 18.0 | 13.3 | 31.6 | 42.0 | 14.0 | 29.6 |
| WFT, mils (microns)⁶ | 1.9 (48.2) | 1.8 (45.3) | 1.9 (47.3) | 2.4 (61.7) | 2.5 (62.4) | 5.6 (141.5) | 7.5 (190.7) | 3.2 (80.5) | 2.4 (60.5) | 7.1 (180.9) | 3.4 (86.0) |
| DFT, mils (microns)⁷ | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) |
| Theoretical Dry Film Coverage @ 1 mil, ft²/gal (m²/liter) | 845 (20.7) | 899 (22.1) | 861 (21.1) | 660 (16.2) | 653 (16.0) | 288 (7.1) | 214 (5.3) | 506 (12.4) | 674 (16.5) | 225 (5.5) | 474 (11.6) |
| Recommended Curing Min Air Set, hrs | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 0.5 | 2 |
| Hours Cure °F/hrs³ | 1400/0.25 | 200/2 | 200/2, 800/1 | 200/2 | 200/2 | 200/2 | 200/2 | 200/2 | 200/2, 800/1 | 200/1 | 200/2 |
| Application Temperature, °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 |
| Thinner⁴ | 623-T | 634-AL-T | 634-ALP-T | 634-AS-T | 634-AS-T | 634-BN-T | 634-BNSC-T | 634-GR-T | 634-SIC-T | H ₂ O | 634-ZO-T |
| Coating pH | 8–9.5 | 4–5 | 2–3 | 8–9.5 | 8–9.5 | 11–12 | 4–5 | 8–9 | 2–3 | 7–8 | 11–12 |
| Flash Point, °F | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Weight/Gallon, lbs⁵ | 12.5 | 12.0 | 16.5 | 12.0 | 12.5 | 9.5 | 10.0 | 10.0 | 16.5 | 12.0 | 14.5 |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

¹ Temperature limit applies to oxidizing atmospheres only. Can be used in vacuum/inert atmospheres to 2000 °C.

² Mix ratio is Powder : Liquid. Ratios may be altered as required to adjust viscosity.

³ A short cure is recommended, however, most of these products can be air set then ramped up to operating temperature immediately.

⁴ Distilled water may also be used to thin all products. Use 1–2% distilled water by weight.

⁵ For two-part systems, this only refers to the weight per gallon for the powder portion of the mixture.

⁶ Estimated Wet Film Thickness (WFT).

⁷ Recommended Dry Film Thickness (DFT).

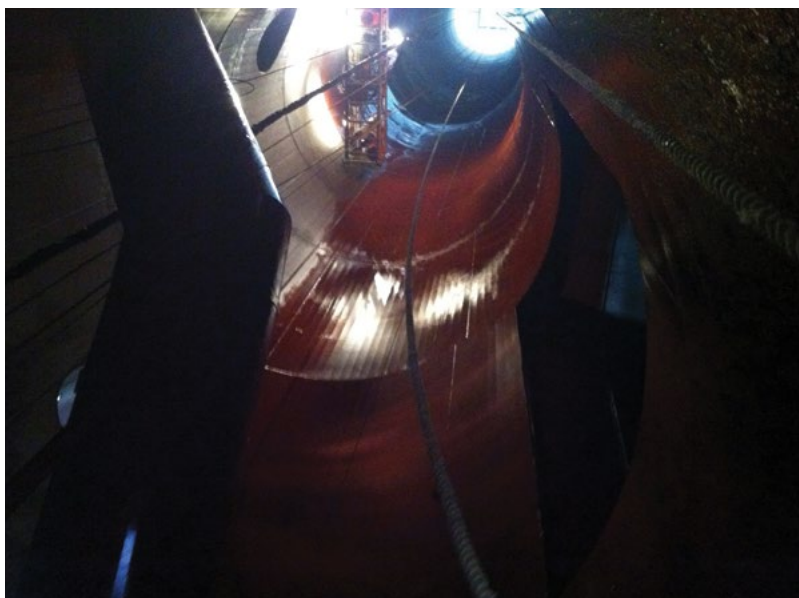
Abbreviations

NA Not Applicable

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.



Corr-Paint™ CP2050-LF coats flare stack.



Corr-Paint™ CP2060



Corr-Paint™ CP2060 coats pump housing.

Aremco's Corr-Paint™ epoxy and urethane-based coatings are used for producing corrosion and wear resistant barriers to 500 °F. Typical applications include tanks, pipelines, boilers, precipitators, scrubbers, bag houses, cyclones, hoppers and other process equipment used in the power, pulp and paper, and chemical processing industries.

PRODUCT HIGHLIGHTS

Urethane

| | |
|--------|-----------|
| CP2000 | Jet Black |
| CP2010 | Aluminum |
| CP2020 | Gray |

Epoxy-Phenolics

| | |
|-----------|------------------------|
| CP2050-FF | Fine-Fiber Reinforced |
| CP2050-LF | Large-Fiber Reinforced |
| CP2050-NF | Unfilled |

Novolac-Epoxy

| | |
|--------|------------------------------|
| CP2060 | SiC Filled, Hi-Build, 500 °F |
| CP2070 | Gray, Low Viscosity, 300 °F |
| CP2075 | Gray, Hi-Build, 400 °F |

FEATURES

- Single-Part, No Mixing
- Low Viscosity
- Cures at Room Temperature
- High Wear Resistance
- Excellent Salt Spray Resistance
- Maximum Temperature, 400 °F
- Two-Part Systems
- High Viscosity for Thick Depositions
- Cures at Room Temperature
- Excellent Corrosion Resistance
- Excellent Wear Resistance
- Maximum Use Temperature, 500 °F
- Two-Part Systems
- Cures at Room Temperature
- Excellent Corrosion Resistance
- Excellent Wear Resistance



Corr-Paint™ CP2000 coats motor housing.

CORROSION PROTECTIVE URETHANE & EPOXY COATINGS PROPERTIES

| Type | URETHANE | | | EPOXY-PHENOLIC | NOVOLAC-EPOXY | | |
|---|-------------------------------|------------------------|------------------------|------------------------|---------------------|------------------------|------------------|
| Product Number | CP2000 | CP2010 | CP2020 | CP2050-XX ¹ | CP2060 ¹ | CP2070 | CP2075 |
| Color (cured) | Gloss Black | Aluminum | Gloss Gray | Brown-Red | Gray | Gray | Gray |
| Temp. Continuous, °F(°C) | 400 (204) | 400 (204) ² | 400 (204) ² | 400 (204) | 500 (260) | 300 (150) ⁷ | 400 (204) |
| No. Components | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| Mix Ratio, by Weight | NA | NA | NA | 1 : 1 | 100 : 8 | 100:42 (2 : 1 Vol) | 100:26 (3:1 Vol) |
| Viscosity, cP | 200–240 | 300–600 | 200–500 | Paste | Paste | 800–1000 | Paste |
| Specific Gravity, g/cc | 1.05 | 1.08 | 1.08 | 1.60 | 1.90 | 1.10 | 1.10 |
| Solids by Weight, % | 67.0 | 70.0 | 72.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Solids by Volume, % | 49.0 | 66.0 | 77.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| WFT, mils (microns) ³ | 4.0 (101.6) | 4.0 (101.6) | 4.0 (101.6) | 50+ (1270.0) | 50+ (1270.0) | 7.0 (177.8) | 20.0 (508.0) |
| DFT, mils (microns) ⁴ | 2.0 (50.8) | 2.6 (67.1) | 3.1 (78.7) | 50+ (1270.0) | 50+ (1270.0) | 7.0 (177.8) | 20.0 (508.0) |
| Theoretical Dry Film Coverage ⁵ @ 1 mil, ft ² /gal (m ² /liter) | 722 (17.7) | 1058 (25.9) | 1235 (30.3) | 1604 (39.3) | 1604 (39.3) | 1604 (39.3) | 1604 (39.3) |
| Primer | NR | NR | NR | NR | NR | NR | NR |
| Drying | Touch, hrs | 4–6 | 4–6 | 4–6 | 6–8 | 4 | 5 |
| | Handling, hrs | 6–8 | 6–8 | 6–8 | 12–14 | 6–8 | 8 |
| | Recoat, (min/max), hrs | 3/7 | 6/12 | 3/7 | 4/48 | 4/8 | 4/8 |
| Curing | Min Air Set, hrs ⁶ | 0.5 | 1 | 0.5 | 2 | 8 | 8 |
| | Cure, °F/hrs | RT/24 or 250/1 | RT/24 or 250/1 | RT/24 or 250/1 | RT/48 or 175/4 | RT/48 or 250/6 | RT/24 or 175/4 |
| Application Temp., °F | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 |
| Thinner | Hi-Flash Naptha | Hi-Flash Naptha | Hi-Flash Naptha | NR | NR | Xylene | Xylene |
| Pot Life, hrs at room temp. | NA | NA | NA | 0.70 | 0.75 (500g) | 0.35 (200g) | 0.5 (200g) |
| Flash Point, °F (°C) | 140 (60) | 140 (60) | 140 (60) | > 200 (93) | > 200 (93) | > 200 (93) | > 200 (93) |
| VOC's, lbs/gal | 2.86 | 3.00 | 2.80 | 0.00 | 0.00 | 0.00 | 0.00 |
| Shelf Life @RT, months | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Storage Temperature, °F | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

| Technical Notes for Epoxy Coatings | CP2050-XX | CP2060 | CP2070 | CP2075 |
|-------------------------------------|-----------|--------|--------|--------|
| Lap Shear Strength to Aluminum, psi | | | | |
| 25 °C | 2,700 | 2,300 | 2050 | 2260 |
| 65 °C | — | — | 1900 | 2100 |
| 100 °C | 1,800 | 2,000 | 1250 | 1420 |
| 150 °C | 900 | 1,200 | 225 | 430 |
| 175 °C | 300 | 900 | — | — |
| Flexural Strength, psi | 13,400 | 11,500 | 12,000 | 12,000 |
| Compressive Strength, psi | 10,300 | 12,000 | 8,500 | 8,500 |
| Elongation, % | 3 | 2 | < 2 | < 2 |
| Hardness, Shore D | 86 | 90 | 85 | 85 |

² CP2010 will begin to discolor at 300 °F.

³ Estimated Wet Film Thickness (WFT).

⁴ Recommended Dry Film Thickness (DFT).

⁵ Actual coverage will vary depending on material losses during mixing and application.

⁶ Where a value is provided for "Min Air Set," it is recommended that the coating set at room temp. for, at minimum, the specified time prior to curing.

⁷ Withstands intermittent service temperatures of 350–400 °F if cured for 2 hours at 185 °F.

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Smooth metal surfaces should be abrasive blasted to an SSPC-SP10 near white blast. Remove abrasive residue using air pressure; do not clean with organic solvents

Aremco's Corr-Prep™ CPR2000 is recommended as an alternative when sandblasting is not possible. This is a specially formulated, water-based, zinc phosphate metal etching solution that is non-toxic, non-flammable, non-caustic, and non-corrosive. It etches metal to provide surface profile for superior coating adhesion to aluminum, galvanized metal, steel, and stainless steel. It also helps to improve long-term corrosion protection. Application is simple—just brush or spray liquid on the substrate, allow to sit for 20–30 minutes, then rinse off and dry substrate thoroughly prior to coating.

CHEMICAL RESISTANCE CHART

| Chemical | % | CP2000 | CP2050 | CP2060 | CP2070 | CP2075 |
|---------------------|---------|--------|--------|--------|--------|--------|
| ACIDS | | | | | | |
| Acetic Acid | 20% | B | B | B | B | B |
| Acetic Acid | 80% | B | B | B | B | B |
| Hydrochloric Acid | 10% | A | A | A | A | A |
| Hydrochloric Acid | 20% | A | A | A | A | A |
| Nitric Acid | 10% | A | A | A | A | A |
| Nitric Acid | 20% | B | B | B | B | B |
| Nitric Acid | 50% | D | D | D | D | C |
| Nitric Acid | 100% | D | D | D | D | B |
| Phosphoric Acid | < 40% | B | A | A | A | A |
| Phosphoric Acid | 40–100% | D | C | C | C | C |
| Sulfuric Acid | 10% | A | A | A | A | A |
| Sulfuric Acid | 10–75% | C | B | B | B | B |
| Sulfuric Acid | 75–100% | D | D | D | D | C |
| BASES | | | | | | |
| Potassium Hydroxide | | A | A | A | A | A |
| Sodium Hydroxide | 20% | A | A | A | A | A |
| Sodium Hydroxide | 50% | A | A | A | A | A |
| Sodium Hydroxide | 80% | A | A | A | A | A |
| FUELS & SOLVENTS | | | | | | |
| Acetone | | B | B | B | B | B |
| Alcohol | | A | A | A | A | A |
| Crude Oil | | A | A | A | A | A |
| Diesel | | A | A | A | A | A |
| Gasoline | | A | A | A | A | A |
| Heptane | | A | A | A | A | A |
| Jet Fuel | | A | A | A | A | A |
| Kerosene | | A | A | A | A | A |
| Methyl Ethyl Ketone | | B | B | B | B | B |
| Methylene Chloride | | B | B | A | A | A |
| Toluene | | A | A | A | A | A |
| Xylene | | A | A | A | A | A |

Abbreviations

NA Not Applicable
NR Not Required
DFT Dry Film Thickness
WFT Wet Film Thickness
RT Room Temperature

Key

A No Effect or Excellent
B Minor Effect or Good
C Moderate Effect or Fair
D Severe Effect or Not Recommended

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.



Corr-Paint™ CP4000-S



Corr-Paint™ CP4040-S



Corr-Paint™ CP4040-S

Aremco's Corr-Paint™ CP40xx-S series coatings are formulated using an advanced silicone-polyester resin combined with inorganic fillers and pigments to offer continuous temperature resistance to 600 °F (316 °C) and intermittent resistance to 800 °F (427 °C).

These coatings are single-part, heat curable systems that adhere to a wide range of materials including metals, ceramics, glass, quartz, and refractories, and offer outstanding resistance to outdoor weathering, UV light, salt spray corrosion, oxidation, detergents, and thermal shock.

PRODUCT HIGHLIGHTS

- Single-Part, No Mixing
- Low Viscosity
- Maximum Use Temperature, 600 °F (316 °C)
- Intermittent Use Temperature, 800 °F (427 °C)
- Bonds to Ceramics, Glass, Quartz, Metals
- Excellent Resistance to Moisture & Salt Spray
- Resists Thermal Shock
- Resists Ultraviolet Light

AVAILABLE COLORS*

| | |
|---|--|
|  CP4000-S Black |  CP4060-S Red |
|  CP4010-S Aluminum |  CP4070-S Blue |
|  CP4020-S Gray |  CP4080-S Yellow |
|  CP4040-S White |  CP4090-S Brown |
|  CP4050-S Green |  CP4095-S Orange |

* All colors are matte finish. The colors represented here are approximate and the actual product color may vary.

TYPICAL APPLICATIONS

- | | |
|-------------------|---------------------|
| • Bag Houses | • Furnaces |
| • Boiler Casings | • Ovens |
| • Chimneys | • Kilns |
| • Cyclones | • Lighting Fixtures |
| • Ducting | • Process Vessels |
| • Heaters | • Reformers |
| • Heat Exchangers | • Scrubbers |
| • Exhaust Systems | • Stacks |
| • Engines | • Turbochargers |

HIGH TEMPERATURE SILICONE-POLYESTER COATINGS PROPERTIES

| Type | SILICONE-POLYESTER | | | | | | | | | |
|--|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Product Number | CP4000-S | CP4010-S | CP4020-S | CP4040-S | CP4050-S | CP4060-S | CP4070-S | CP4080-S | CP4090-S | CP4095-S |
| Color (cured) | Black | Aluminum | Gray | White | Green | Red | Blue | Yellow | Brown | Orange |
| Temperature Continuous, °F (°C) | 600 (316) | 600 (316) | 600 (316) | 600 (316) | 600 (316) | 600 (316) | 600 (316) | 600 (316) | 600 (316) | 600 (316) |
| Temperature Intermittent, °F (°C) | 800 (427) | 800 (427) | 800 (427) | 800 (427) | 800 (427) | 800 (427) | 800 (427) | 800 (427) | 800 (427) | 800 (427) |
| No. Components | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | 400–600 | 300–400 | 200–400 | 300–500 | 250–350 | 500–700 | 150–250 | 300–500 | 400–600 | 550–750 |
| Specific Gravity, g/cc | 1.45 | 1.00 | 1.42 | 1.37 | 1.46 | 1.47 | 1.43 | 1.40 | 1.45 | 1.40 |
| Solids by Weight, % | 69.9 | 37.0 | 62.1 | 42.1 | 62.1 | 62.1 | 62.1 | 62.1 | 62.1 | 62.1 |
| Solids by Volume, % | 57.7 | 36.7 | 58.5 | 49.2 | 57.4 | 57.4 | 59.0 | 57.7 | 58.6 | 58.9 |
| WFT, mils (microns) ² | 1.73 (44.0) | 2.73 (69.2) | 1.71 (43.4) | 2.03 (51.6) | 1.74 (44.3) | 1.74 (44.3) | 1.69 (43.0) | 1.73 (44.0) | 1.71 (43.3) | 1.70 (43.2) |
| DFT, mils (microns) ³ | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | 925 (22.7) | 589 (14.5) | 938.0 (23.0) | 789.7 (19.4) | 920.3 (22.6) | 921.1 (22.6) | 946.7 (23.2) | 925.6 (22.7) | 940 (23.1) | 944 (23.2) |
| Primer ⁵ | NR | NR | NR | NR | NR | NR | NR | NR | NR | NR |
| Drying | Touch, hrs | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 |
| | Handling, hrs | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 |
| | Recoat, (min/max), hrs | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 |
| Curing | Min Air Set, hrs ⁶ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cure, °F/hrs ^{7,8} | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 |
| Application Temperature, °F | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 |
| Thinner | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate |
| Pot Life, hrs at room temp. | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Flash Point, °F (°C) | 118 (48) | 115 (46) | 115 (46) | 115 (46) | 115 (46) | 115 (46) | 115 (46) | 115 (46) | 115 (46) | 115 (46) |
| VOC's, lbs/gal | 3.6 | 5.3 | 3.6 | 3.4 | 3.7 | 3.7 | 3.6 | 3.7 | 3.6 | 3.6 |
| Shelf Life @RT, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

¹ Viscosity is measured using a Brookfield LV Viscometer, LV3 Spindle @ 30 RPM.

² Estimated Wet Film Thickness (WFT).

³ Recommended Dry Film Thickness (DFT).

⁴ Actual coverage will vary depending on material losses during mixing and application.

⁵ Primer is only recommended for exterior applications in which salt fog or moisture are present.

⁶ Where a value is provided for "Min Air Set", it is recommended to set the coating at room

temperature for, at minimum, the specified time prior to curing.

⁷ Adequate ventilation is required when curing these products as some outgassing will occur.

⁸ Curing is recommended but not absolutely required if the system is raised slowly to a minimum of 450 °F within 24–48 hours of application and not exposed to high moisture or rain during this initial dwell period.

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Smooth metal surfaces should be abrasive blasted to an SSPC-SP6 near white blast. Remove abrasive residue using air pressure; do not clean with organic solvents.

Aremco's Corr-Prep™ CPR2000 is recommended as an alternative when sandblasting is not possible. This is a specially formulated, water-based, zinc phosphate metal etching solution that is non-toxic, non-flammable, non-caustic, and non-corrosive. It etches metal to provide surface profile for superior coating adhesion to aluminum, galvanized metal, steel, and stainless steel. It also helps to improve long-term corrosion protection. Application is simple — just brush or spray liquid on the substrate, allow to sit for 20–30 minutes, then rinse off and dry substrate thoroughly prior to coating.

Application Notes: Mix thoroughly before use to redisperse fillers and pigments. Apply using a brush, roller or spray gun. When spraying, a maximum dry film thickness of 2 mils (0.002") can be achieved by applying two coats. Recommended fluid nozzle diameter is 40–50 mils, atomizing pressure of 40–50 psi, and distance from work of 8–10". Adequate ventilation is required when applying and curing the coating. Read Safety Data Sheet for further safety instructions.

Abbreviations

NA Not Applicable WFT Wet Film Thickness
NR Not Required RT Room Temperature
DFT Dry Film Thickness

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco's Corr-Paint™ CP40xx-S1 series coatings are formulated using an advanced solvent-based silicone resin combined with inorganic fillers and pigments to offer continuous temperature resistance to 1100 °F (593 °C) and intermittent resistance to 1200 °F (649 °C). A higher temperature formulation, CP4000-S1-HT, offers continuous operation to 1400 °F (593 °C) and intermittent resistance to 1800 °F (982 °C).

These coatings are single-part, heat curable systems that adhere to a wide range of materials including metals, ceramics, glass, quartz, and refractories, and offer outstanding resistance to outdoor weathering, UV light, salt spray corrosion, oxidation, some chemicals, and thermal shock.

PRODUCT HIGHLIGHTS

- Single-Part, No Mixing
- Low Viscosity
- Maximum Use Temperature, 1100–1400 °F (593–760 °C)
- Good Chemical Resistance
- Bonds to Ceramics, Glass, Quartz, Metals
- Excellent Resistance to Moisture & Salt Spray
- Resists Thermal Shock
- Resists Ultraviolet Light
- Solvent-Based



Corr-Paint™ CP4000-S1

AVAILABLE COLORS*

| | |
|---|---|
|  CP4000-S1 Black |  CP4055-S1 Pale Green |
|  CP4000-S1-HT Black |  CP4060-S1 Red |
|  CP4010-S1 Aluminum |  CP4070-S1 Blue |
|  CP4020-S1 Gray |  CP4080-S1 Yellow |
|  CP4040-S1 White |  CP4090-S1 Brown |
|  CP4050-S1 Green |  CP4095-S1 Orange |

* All colors are matte finish. The colors represented here are approximate and the actual product color may vary.

TYPICAL APPLICATIONS

- Bag Houses
- Boiler Casings
- Chimneys
- Cyclones
- Ducting
- Heaters
- Heat Exchangers
- Exhaust Systems
- Engines
- Furnaces, Ovens, Kilns
- Lighting Fixtures
- Process Vessels
- Reformers
- Scrubbers
- Stacks
- Turbochargers

HIGH TEMPERATURE SILICONE RESIN COATINGS PROPERTIES

| Product Number | | CP4000-S1 | CP4000-S1-HT | CP4010-S1 | CP4020-S1 | CP4040-S1 | CP4050-S1 | CP4055-S1 | CP4060-S1 | CP4070-S1 | CP4080-S1 | CP4090-S1 | CP4095-S1 |
|--|--------------------------------------|------------|--------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Color (cured) | | Black | Black | Aluminum | Gray | White | Green | Pale Green | Red | Blue | Yellow | Brown | Orange |
| Temperature Continuous, °F (°C) | | 1100 (593) | 1400 (760) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) | 1100 (593) |
| No. Components | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | | 250–500 | 900–1200 | 250–500 | 150–250 | 250–500 | 300–500 | 500–1000 | 600–800 | 350–500 | 300–500 | 300–500 | 500–700 |
| Specific Gravity, g/cc | | 1.49 | 1.61 | 1.00 | 1.35 | 1.34 | 1.36 | 1.39 | 1.34 | 1.35 | 1.36 | 1.38 | 1.37 |
| Solids by Weight, % | | 57.1 | 79.0 | 41.0 | 57.1 | 57.1 | 57.1 | 59 | 57.4 | 56.6 | 56.6 | 56.6 | 56.6 |
| Solids by Volume, % | | 42.5 | 53.6 | 42.4 | 44.4 | 44.4 | 44.3 | 42.8 | 45.1 | 44.3 | 43.4 | 43.2 | 43.4 |
| Wet Film Thickness, Estimate, mils (microns) | | 2.4 (59.8) | 1.9 (47.4) | 2.4 (59.9) | 2.3 (57.3) | 2.3 (57.2) | 2.3 (57.4) | 2.4 (59.8) | 2.2 (56.4) | 2.3 (57.3) | 2.3 (58.6) | 2.3 (58.6) | 2.3 (58.6) |
| Dry Film Thickness, Estimated, mils (microns) | | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) |
| Theoretical Dry Film Coverage @ 1 mil, ft ² /gal (m ² /liter) ² | | 681 (16.7) | 860 (21.1) | 680 (16.7) | 711 (17.5) | 712 (17.5) | 710 (17.4) | 687 (16.9) | 723 (17.7) | 711 (17.4) | 696 (17.1) | 694 (17.0) | 697 (17.1) |
| Drying | Touch, hrs | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 |
| | Handling, hrs | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 |
| | Recoat, (min/max), hrs | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 |
| Curing | Minimum Air Set, hrs ³ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cure Schedule, °F/hrs ^{4,5} | 480 / .75 | 200 / .25 480 / .25 1200 / .25 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 | 480 / .75 |
| Application Temperature, °F | | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 |
| Thinner | | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate | PM Acetate |
| Flash Point, °F (°C) | | ~ 118 (48) | ~ 118 (48) | ~ 108 (42) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) |
| VOC's, lbs/gal | | 5.3 | 3.9 | 5.7 | 4.8 | 4.8 | 4.9 | 4.7 | 4.8 | 4.9 | 4.9 | 5.0 | 5.0 |
| Shelf Life @RT, months | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

¹ Viscosity is measured using a Brookfield LV Viscometer, LV3 Spindle @ 30 RPM.

² Actual coverage will vary depending on material losses during mixing and application.

³ Minimum Air Set is the minimum time recommended for drying the coating prior to heat curing.

⁴ Adequate ventilation is required when curing these products as some outgassing will occur.

⁵ Curing is recommended but not absolutely required if the system is raised slowly to a minimum of 500 °F within 24–48 hours of application and not exposed to high moisture or rain during this initial dwell period.

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. Smooth metal surfaces should be abrasive blasted to an SSPC-SP6 near white blast. Remove abrasive residue using air pressure; do not clean with organic solvents.

Aremco's Corr-Prep™ CPR2000 is recommended as an alternative when sandblasting is not possible. This is a specially formulated, water-based, zinc phosphate metal etching solution that is non-toxic, non-flammable, non-caustic, and non-corrosive. It etches metal to provide surface profile for superior coating adhesion to aluminum, galvanized metal, steel, and stainless steel. It also helps to improve long-term corrosion protection. Application is simple — just brush or spray liquid on the substrate, allow to sit for 20–30 minutes, the rinse off and dry substrate thoroughly prior to coating.

Application Notes: Mix thoroughly before use to redisperse fillers and pigments. Apply using a brush, roller or spray gun. When spraying, a maximum dry film thickness of 2–3 mils (0.002–0.003") can be achieved by applying two coats. Recommended fluid nozzle diameter is 40–50 mils, atomizing pressure of 40–50 psi, and distance from work of 8–10". Adequate ventilation is required when applying and curing the coating. Read Safety Data Sheet for further safety instructions.

Abbreviations

RT Room Temperature

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco's Corr-Paint™ CP40xx-S2 series silicone-ceramic coatings are single-part, room temperature cure systems that provide ultra-high temperature resistance up to 1800 °F (982 °C) along with exceptional resistance to outdoor weathering, UV, salt-spray corrosion, and flame impingement.

PRODUCT HIGHLIGHTS

- Ultra-High Temperature Resistance
- Room Temperature Curing
- Single Part, No Catalyst Required
- Sprayable, Low Viscosity
- Moisture & Salt Spray Resistant
- Flame Resistant
- UV Resistant
- High Dielectric Strength

COATINGS COLOR CONTINUOUS INTERMITTENT

| | | | |
|--------------|--------|------|------|
| CP4000-S2 | Black | 1000 | 1200 |
| CP4000-S2-HT | Black | 1400 | 1800 |
| CP4010-S2 | Silver | 1100 | 1200 |
| CP4020-S2-HT | Gray | 1400 | 1800 |
| CP4040-S2-HT | White | 1400 | 1800 |
| CP4045-S2-HT | White | 1500 | 1600 |
| CP4080-S2-HT | Yellow | 1400 | 1800 |








TYPICAL APPLICATIONS

- Boilers
- Chimneys
- Ducting
- Heaters
- Heat Exchangers
- Exhaust Systems
- Engines
- Flight Decks
- Furnaces, Ovens, Kilns
- Process Vessels
- Reformers
- Scrubbers
- Stacks



Corr-Paint™ CP4000-S2

AVAILABLE COLORS*

| | |
|---|---|
|  CP4000-S2 Black |  CP4040-S2-HT White |
|  CP4000-S2-HT Black |  CP4045-S2-HT White |
|  CP4010-S2 Silver |  CP4080-S2-HT Yellow |
|  CP4020-S2-HT Gray | |

* All colors are matte finish. The colors represented here are approximate and the actual product color may vary.

CORR-PAINT™ HIGH TEMPERATURE POLYSILOXANE COATINGS PROPERTIES

| Product Number | | CP4000-S2 | CP4000-S2-HT | CP4010-S2 | CP4020-S2-HT | CP4040-S2-HT | CP4045-S2-HT | CP4080-S2-HT |
|--|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Color (cured) | | Black | Black | Silver | Navy Gray | Navy White | Boron Nitride | Navy Yellow |
| Temperature Continuous, °F (°C) | | 1000 (538) | 1400 (760) | 1100 (593) | 1400 (760) | 1400 (760) | 1500 (816) | 1400 (760) |
| Temperature Intermittent, °F (°C) | | 1200 (649) | 1800 (982) | 1200 (649) | 1800 (982) | 1800 (982) | 1700 (927) | 1800 (982) |
| No. Components | | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP¹ | | 250–500 | 150–500 | 200–500 | 200–400 | 250–500 | 500–1000 | 200–400 |
| Specific Gravity, g/cc | | 1.43 | 1.50 | 1.07 | 1.55 | 1.35 | 1.21 | 1.53 |
| Solids by Weight, % | | 83.0 | 72.9 | 67.3 | 85.5 | 85.2 | 66.0 | 85.3 |
| Solids by Volume, % | | 77.1 | 70.1 | 59.6 | 74.5 | 75.5 | 58.8 | 74.4 |
| Wet Film Thickness, Estimated, mils (microns) | | 1.3 (33.0) | 1.4 (36.3) | 1.7 (42.7) | 1.4 (34.1) | 1.3 (33.7) | 1.7 (43.2) | 1.34 (34.2) |
| Dry Film Thickness, Estimated, mils (microns) | | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) |
| Theoretical Dry Film Coverage @ 1 mil, ft²/gal (m²/liter)² | | 1236 (30.3) | 1124 (27.6) | 955 (23.4) | 1194 (29.3) | 1211 (29.7) | 944 (23.2) | 1193 (29.3) |
| Drying | Touch, hrs | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 |
| | Handling, hrs | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 |
| | Recoat, (min/max), hrs | 1 / 24 | 1–2 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 |
| Curing | Minimum Air Set, hrs³ | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cure Schedule, °F/hrs^{4,5} | RT / 24–48 or 450 / 1 | RT / 24–48 or 450 / 1 | RT / 24–48 or 450 / 1 | RT / 24–48 or 450 / 1 | RT / 24–48 or 450 / 1 | RT / 24–48 or 450 / 1 | RT / 24–48 or 450 / 1 |
| Application Temperature, °F | | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 |
| Thinner | | T-Butyl Acetate | T-Butyl Acetate | T-Butyl Acetate | T-Butyl Acetate | T-Butyl Acetate | T-Butyl Acetate | T-Butyl Acetate |
| Flash Point, °F (°C) | | ~ 118 (48) | ~ 113 (45) | ~108 (42) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) | ~ 118 (48) |
| VOC's, lbs/gal | | 2.0 | 2.5 | 2.9 | 1.8 | 1.7 | 3.3 | 1.8 |
| Shelf Life @RT, months | | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 | 40–90 |

Reference Notes

- ¹ Viscosity is measured using a Brookfield LV Viscometer, LV3 Spindle @ 30 RPM.
- ² Actual coverage will vary depending on material losses during mixing and application.
- ³ This is the minimum time recommended to set the coating at room temperature before placing in operation or recoating.

⁴ Adequate ventilation is required when applying and curing these products as some outgassing will occur.

⁵ This coating can be cured at room temperature (RT) or heat cured more rapidly at 450 °F in one hour.

Surface Preparation Notes

Metals should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. Smooth metal surfaces should be abrasive blasted to an SSPC-SP6 near white blast. Remove abrasive residue using air pressure.

Aremco's Corr-Prep™ CPR2000 is recommended as an alternative when sandblasting is not possible. This is a specially formulated, water-based, zinc phosphate metal etching solution that is non-toxic, non-flammable, non-caustic, and non-corrosive. It etches metal to provide surface profile for superior coating adhesion to aluminum, galvanized metal, steel, and stainless steel. It also helps to improve long-term corrosion protection. Application is simple — just brush or spray liquid on the substrate, allow to sit for 20–30 minutes, the rinse off and dry substrate thoroughly prior to coating.

Application Notes: Mix thoroughly before use to redisperse fillers and pigments. Apply using a brush, roller or spray gun. When spraying, a maximum dry film thickness of 2 mils (0.002") can be achieved by applying two coats. Recommended fluid nozzle diameter is 40–50 mils, atomizing pressure of 40–50 psi, and distance from work of 8–10". Adequate ventilation is required when applying and curing the coating. Read Safety Data Sheet for further safety instructions.

Abbreviations

RT Room Temperature

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

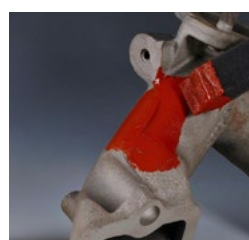
The user assumes all risk of use or handling whether or not in accordance with directions or suggestions, or used singly or in combination with other products.



Corr-Paint™ CP4020



Corr-Paint™ CP4090



Corr-Paint™ CP4060



Corr-Paint™ CP4070

Aremco's Corr-Paint™ CP40xx series coatings are formulated using an advanced water-based silicone emulsion combined with inorganic fillers and pigments to offer VOC compliant coatings with continuous temperature resistance to 1100 °F (593 °C) and intermittent resistance to 1200 °F (649 °C).

These coatings are single-part, heat curable systems that adhere to a wide range of materials including metals, ceramics, glass, quartz, and refractories, and offer outstanding resistance to outdoor weathering, UV light, salt spray corrosion, oxidation, some chemicals, and thermal shock.

PRODUCT HIGHLIGHTS

- Single-Part, No Mixing
- Low Viscosity
- Maximum Use Temperature, 1100 °F (593 °C)
- Intermittent Use Temperature, 1200 °F (649 °C)
- Bonds to Ceramics, Glass, Quartz, Metals
- Excellent Resistance to Moisture & Salt Spray
- Resists Thermal Shock
- Resists Ultraviolet Light
- Good Chemical Resistance
- Water-Based
- Low Volatile Organic Compounds (VOCs)

AVAILABLE COLORS*

| | |
|---|--|
|  CP4000 Black |  CP4060 Red |
|  CP4020 Gray |  CP4070 Blue |
|  CP4040 White |  CP4080 Yellow |
|  CP4050 Green |  CP4090 Brown |
|  CP4055 Pale Green |  CP4095 Orange |

* All colors are matte finish. The colors represented here are approximate and the actual product color may vary.

TYPICAL APPLICATIONS

- Bag Houses
- Boiler Casings
- Ceramic Cloth
- Ceramic Fiberboard
- Chimneys
- Cyclones
- Ducting
- Heaters
- Heat Exchangers
- Exhaust Systems
- Engines
- Furnaces, Ovens, Kilns
- Lighting Fixtures
- Process Vessels
- Reformers
- Scrubbers
- Stacks
- Turbochargers

HIGH TEMPERATURE WATER-BASED SILICONE COATINGS PROPERTIES

| Product Number | | CP4000 | CP4020 | CP4040 | CP4050 | CP4055 | CP4060 | CP4070 | CP4080 | CP4090 | CP4095 |
|--|--------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Color (cured) | | Flat Black | Gray | White | Green | Pale Green | Red | Blue | Yellow | Brown | Orange |
| Temperature Continuous, °F (°C) | | 1100(593) | 1100(593) | 1100(593) | 1100(593) | 1100(593) | 1100(593) | 1100(593) | 1100(593) | 1100(593) | 1100(593) |
| No. Components | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | | 400–800 | 400–800 | 400–900 | 500–750 | 500–1000 | 750–950 | 300–600 | 500–700 | 300–500 | 500–700 |
| Specific Gravity, g/cc | | 1.32 | 1.28 | 1.27 | 1.31 | 1.35 | 1.31 | 1.25 | 1.33 | 1.32 | 1.32 |
| Solids by Weight, % | | 51.5 | 44.2 | 44.2 | 48.5 | 55.0 | 46.5 | 44.8 | 47.0 | 44.5 | 44.5 |
| Solids by Volume, % | | 38.1 | 38.2 | 46.1 | 39.5 | 38.1 | 38.3 | 38.5 | 38.0 | 37.8 | 37.8 |
| Wet Film Thickness, Estimate, mils (microns) | | 2.6 (66.5) | 2.6 (66.4) | 2.2 (55.1) | 2.5 (64.3) | 2.6 (66.6) | 2.6 (66.3) | 2.6 (66.3) | 2.6 (66.8) | 2.7 (67.2) | 2.6 (64.9) |
| Dry Film Thickness, Estimated, mils (microns) | | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) |
| Theoretical Dry Film Coverage @ 1 mil, ft ² /gal (m ² /liter) ² | | 611 (14.9) | 613 (15.1) | 740 (18.2) | 634 (15.6) | 612 (15.0) | 614 (15.1) | 617 (15.2) | 610 (15.0) | 606 (14.9) | 628 (15.4) |
| Drying | Touch, hrs | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 |
| | Handling, hrs | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 |
| | Recoat, (min/max), hrs | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 |
| Curing | Minimum Air Set, hrs ³ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Cure Schedule, °F/hrs ^{4,5} | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 | 450 / 1 or 480 / .75 |
| Application Temperature, °F | | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 | 50–120 |
| Thinner | | Distilled Water | Distilled Water | Distilled Water | Distilled Water | Distilled Water | Distilled Water | Distilled Water | Distilled Water | Distilled Water | Distilled Water |
| Flash Point, °F (°C) | | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) |
| VOC's, lbs/gal | | 1.04 | 0.99 | 0.98 | 0.98 | 0.67 | 0.98 | 1.01 | 0.95 | 0.98 | 0.98 |
| Shelf Life @RT, months | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 | 55–85 |

Reference Notes

¹ Viscosity is measured using a Brookfield LV Viscometer, LV3 Spindle @ 30 RPM.

² Actual coverage will vary depending on material losses during mixing and application.

³ Minimum Air Set is the minimum time recommended for drying the coating prior to heat curing.

⁴ Adequate ventilation is required when curing these products as some outgassing will occur.

⁵ Curing is recommended but not absolutely required if the system is raised slowly to a minimum of 450 °F within 24–48 hours of application and not exposed to high moisture or rain during this period.

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. Smooth metal surfaces should be abrasive blasted to an SSPC-SP6 near white blast. Remove abrasive residue using air pressure; do not clean with organic solvents.

Aremco's Corr-Prep® CPR2000 is recommended as an alternative when sandblasting is not possible. This is a specially formulated, water-based, zinc phosphate metal etching solution that is non-toxic, non-flammable, non-caustic, and non-corrosive. It etches metal to provide surface profile for superior coating adhesion to aluminum, galvanized metal, steel, and stainless steel. It also helps to improve long-term corrosion protection. Application is simple — just brush or spray liquid on the substrate, allow to sit for 20–30 minutes, the rinse off and dry substrate thoroughly prior to coating.

Application Notes: Mix thoroughly before use to redisperse fillers and pigments. Apply using a brush, roller or spray gun. When spraying, a maximum dry film thickness of 2 mils (0.002") can be achieved by applying two coats. Recommended fluid nozzle diameter is 40–50 mils, atomizing pressure of 40–50 psi, and distance from work of 8–10". Adequate ventilation is required when applying and curing the coating. Read Safety Data Sheet for further safety instructions.

Abbreviations

RT Room Temperature

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.



Corr-Paint™ CP3015-AL



Corr-Paint™ CP3015-BL

Aremco's Corr-Paint™ CP3015-xx series coatings are silicate-bonded, ceramic and/or metal-filled, aqueous-based systems that provide excellent resistance to thermal shock, oxidation, and chemical corrosion, with good color stability for applications as high as 1500 °F (816 °C).

These coatings are single-part, fast curing systems that adhere well to carbon and stainless steels, ceramics and refractories. Mainly recommended for interior system protection, several standard colors are provided and custom colors are available upon request.

TYPICAL APPLICATIONS

- Bag Houses
- Boiler Casings
- Ceramic Cloth
- Ceramic Fiberboard
- Chimneys & Stacks
- Heaters
- Heat Exchangers
- Exhaust Systems
- Engines
- Furnaces, Ovens, Kilns
- Rotary Calciners

PRODUCT HIGHLIGHTS

CP3015-AL Aluminum-Ceramic, 1200 °F (649 °C)

CP3015-BL Black Pigmented, 1500 °F (816 °C)

CP3015-GR Gray Pigmented, 1400 °F (760 °C)

CP3015-SS Stainless Steel, 1400 °F (760 °C)

CP3015-WH Off-White, Zirconia Filled, 1500 °F (816 °C)

ULTRA HIGH TEMPERATURE CERAMIC COATINGS PROPERTIES

| Product Number | | CP3015-AL | CP3015-BL | CP3015-GR | CP3015-SS | CP3015-WH |
|--|-------------------------------|---------------|---------------|--------------|-----------------|--------------|
| Color | | Aluminum | Black | Gray | Stainless Steel | White |
| Temperature Continuous, °F (°C) | | 1200 (649) | 1500 (816) | 1400 (760) | 1400 (760) | 1500 (816) |
| No. Components | | 1 | 1 | 1 | 1 | 1 |
| Viscosity, cP ¹ | | 250–900 | 600–900 | 600–900 | 200–500 | 600–900 |
| Specific Gravity, g/cc | | 1.32 | 1.54 | 1.38 | 1.47 | 1.37 |
| Solids by Weight, % | | 36.8 | 50.0 | 40.0 | 42.3 | 40.0 |
| Solids by Volume, % | | 19.3 | 46.3 | 19.6 | 41.4 | 20.6 |
| WFT, mils (microns) ² | | 5.20 (131.9) | 2.16 (54.9) | 5.09 (129.4) | 2.42 (61.4) | 4.87 (123.6) |
| DFT, mils (microns) ³ | | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) | 1.0 (25.4) |
| Theoretical Dry Film Coverage ⁴ @ 1 mil, ft ² /gal (m ² /liter) | | 309 (7.6) | 742 (18.2) | 315 (7.7) | 664 (16.3) | 330 (8.1) |
| Primer ⁵ | | NR | NR | NR | NR | NR |
| Drying | Touch, hrs | 1–2 | 1–2 | 1–2 | 1–2 | 1–2 |
| | Handling, hrs | 2–4 | 2–4 | 2–4 | 2–4 | 2–4 |
| | Recoat, (min/max), hrs | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 | 1 / 24 |
| Curing | Min Air Set, hrs ⁶ | 1 | 1 | 1 | 1 | 1 |
| | Cure, °F/hrs ⁷ | 200/2 + 500/1 | 200/2 + 500/1 | RT / 24 | RT / 24 | RT / 24 |
| Application Temperature, °F | | 50–90 | 50–90 | 50–90 | 50–90 | 50–90 |
| Thinner | | CP3015-AL-T | CP3015-BL-T | CP3015-GR-T | CP3015-SS-T | CP3015-WH-T |
| Pot Life, hrs at room temp. | | NA | NA | NA | NA | NA |
| Flash Point, °F (°C) | | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) | > 212 (100) |
| VOC's, lbs/gal | | 0 | 0 | 0 | 0 | 0 |
| Shelf Life @RT, months | | 6 | 6 | 6 | 6 | 6 |
| Storage Temperature, °F | | 40–85 | 40–85 | 40–85 | 40–85 | 40–85 |

Reference Notes

¹ Viscosity is measured using a Brookfield LV Viscometer, LV3 Spindle @ 30 RPM.

² Estimated Wet Film Thickness (WFT).

³ Recommended Dry Film Thickness (DFT).

⁴ Actual coverage will vary depending on material losses during application.

⁵ Primer is only recommended for exterior applications in which salt fog or moisture are present.

⁶ Where a value is provided for "Min Air Set", it is recommended to set the coating at room temperature for, at minimum, the specified time prior to curing.

⁷ Curing is recommended but not absolutely required if the system is raised slowly to a minimum of 500 °F within 24–48 hours of application and not exposed to high moisture or rain during this initial dwell period.

Surface Preparation Notes

All surfaces should be free of oil, grease, dirt, corrosives, oxides, paints or other foreign matter. No further preparation is required when coating ceramics, refractories or graphites. Smooth metal surfaces should be abrasive blasted to an SSPC-SP10 near white blast. Remove abrasive residue using air pressure; do not clean with organic solvents.

Aremco's Corr-Prep™ CPR2000 is recommended as an alternative when sandblasting is not possible. This is a specially formulated, water-based, zinc phosphate metal etching solution that is non-toxic, non-flammable, non-caustic, and non-corrosive. It etches metal to provide surface profile for superior coating adhesion to aluminum, galvanized metal, steel, and stainless steel. It also helps to improve long-term corrosion protection. Application is simple—just brush or spray liquid on the substrate, allow to sit for 20–30 minutes, then rinse off and dry substrate thoroughly prior to coating.

Application Notes: Mix thoroughly before use to redisperse fillers and pigments. Apply using a brush, roller or spray gun. When spraying, a maximum dry film thickness of 2 mils (0.002") can be achieved by applying two coats. Recommended fluid nozzle diameter is 40–50 mils, atomizing pressure of 40–50 psi, and distance from work of 8–10". Adequate ventilation is required when applying and curing the coating. Read Safety Data Sheet for further safety instructions.

Abbreviations

NA Not Applicable
 NR Not Required or Recommended
 DFT Dry Film Thickness
 WFT Wet Film Thickness
 RT Room Temperature

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco offers an impressive selection of high performance epoxies for specialty bonding and potting applications to 600 °F. These products can be applied to a myriad of substrates, offering exceptional chemical, electrical and mechanical properties.

PRODUCT HIGHLIGHTS

Ultra High Temperature

- 526N** Clear-Amber, 1:1 System for Tough Bonding Applications.
- 570** Single-Part Contact Adhesive, Excellent Flexibility.
- 805** Aluminum-Filled, Low Shrinkage, High Thermal Conductivity, For Bonding & Molding.
- 2330** Single-Part, Heat Curable, Silicone Elastomer Adhesive.
- 2335** Ceramic-Filled, Low Expansion, High Lap-Shear Strength & Chemical Resistance, Low Outgassing.

High Temperature, Special Purpose

- 568** Aluminum-Filled, 1:1, High Bond Strength, Excellent Thermal Conductivity.
- 631** Clear-Amber, 1:1, High Bond Strength & Corrosion Resistance.
- 807** 10 Minute Set, Non-Sagging, 1:1, Excellent Electrical & Mechanical Properties.
- 820** Clear, 1:1, 45-Minute Cure System with Good Flexibility.
- 2150** Fast-Setting, Ceramic-Filled, High Vibration Resistance & Bond Strength.

High Temperature Potting Compounds

- 2315** High Temperature Resistance, Thermally Conductive, Low Viscosity.
- 2315X** Similar to 2315 Providing Improved Crack Resistance & Bond Strength.
- 2318** High Temperature, Low Viscosity, Room Temperature Cure.
- 2340** High Temperature, Low Viscosity, Low Expansion, High Glass Transition Temperature & Chemical Resistance.

High Temperature, Maintenance & Repair

- 657** Stainless-Steel Filled, 1:1, High Bond Strength & Corrosion Resistance.
- 2200** Glass Fiber & Kevlar-Reinforced, Epoxy-Novolac, High Strength & Excellent Abrasion & Corrosion Resistance.
- 2210** Aluminum & Ceramic-Filled, Vibration & Impact Resistant; For Repairing Aluminum Mold & Wear Surfaces.
- 2220** Ceramic-Filled, High Chemical Resistance, Machinable; For Repairing Deeply Corroded Parts.

Ultra High Bond Strength

- 2300** Unfilled, Low Viscosity, Rubberized Epoxy, Exceptional Bond Strength & Chemical Resistance.
- 2310** Ceramic-Filled, 1:1, High Lap Shear & Peel Strength, Resistant to Extreme Shock, Vibration & Flexing; Ideal for Autoclave & Cryogenics.
- 2320** Toughened, Unfilled, Fast-Setting, BPA Free, 2:1, High Peel & Shear Strength.



Aremco-Bond™ 570 bonds ceramic to copper nozzle.



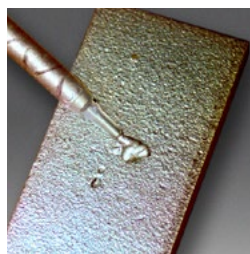
Aremco-Bond™ 568 bonds copper coil.



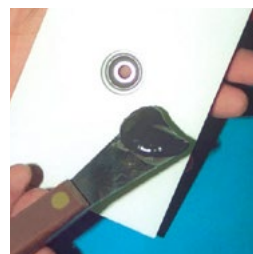
Aremco-Bond™ 526N bonds alumina to alumina ceramic.



Aremco-Bond™ 631 bonds sapphire tube to stainless steel.



Aremco-Bond™ 657-FST repairs defects in cast iron.



Aremco-Bond™ 2150 bonds ceramic wear tile.

HIGH PERFORMANCE EPOXIES PROPERTY CHART

| Category | | Ultra High Temperature | | | | | High Temperature, Special Purpose | | | | | High Temperature Potting Compounds | | | | High Temperature, Maintenance & Repair | | | | Ultra High Bond Strength | | |
|-------------------|--|------------------------|-----------------|----------------|--------------------------|---------------|-----------------------------------|--------------------|------------|------------|--------------|------------------------------------|---------------|--------------|---------------|--|------------|------------|------------|--------------------------|------------|------------|
| Product Number | | 526N ^{5,6} | 570 | 805 | 2330 | 2335 | 568 | 631 ^{5,6} | 807 | 820 | 2150 | 2315 ⁶ | 2315X | 2318 | 2340 | 657 | 2200 | 2210 | 2220 | 2300 | 2310 | 2320 |
| Handling & Curing | Mix Ratio by Weight, resin:hardener ¹ | 1:1 | NA | 100:12 | NA | 100:5.5 | 1:1 | 1:1 | 1:1 | 1:1 | 100:13 | 100:25 | 100:25 | 100:12 | 100:10 | 1:1 | 1:1 | 100:11 | 100:28 | 100:10 | 1:1 | 2:1 |
| | Specific Gravity, g/cc @ 25 °C | 1.23 | 0.95 | 1.66 | 1.43 | 1.80 | 0.85 | 1.12 | 1.39 | 1.15 | 1.50 | 1.95 | 1.95 | 1.58 | 1.76 | 1.65 | 1.60 | 1.80 | 1.70 | 1.10 | 1.35 | 1.10 |
| | Mixed Viscosity, cP @ 25 °C | 8,500 | 35,000 | 11,000 | 38,000 | Paste | Paste | 25,000 | 75,000 | 12,000 | 91,000 | 3,000 | 4,000 | 16,000 | 39,000 | Paste | 165,000 | 40,000 | 120,000 | 5,000 | 45,000 | 35,000 |
| | Pot Life, 100 gm mass @ 25 °C, hrs | 2.50 | NA | ≤ 1.0 | NA | 1.50 | 4.00 | 4.00 | 0.25 | 0.25 | > 8 | 2.00 | > 8 | 0.70 | > 4 | 4.00 | 0.70 | 1.00 | 1.00 | 0.75 | 0.75 | 1.00 |
| | Recommended Cure, hr/°F | 2/200 + 2/325 | .3/180 + .5/350 | 24/100 + 2/200 | 1/200 | 2/200 + 2/350 | 2/200 | 2/200 | 1/RT | .75/RT | 24/RT | 2/160 + 2/300 | 2/160 + 2/300 | 4/RT + 2/200 | 2/175 + 2/300 | 2/200 | 24–48/RT | 24–48/RT | 12–24/RT | 2/150 | 2/150 | 24–48/RT |
| | Alternate Cure, hr/°F | 3–4/300 | 24/RT + .5/350 | 24/RT + 2/200 | .75 / 300 or .50 / 400 F | 8/300 | 24–48/RT | 24–48/RT | — | — | 1/RT + 4/175 | 6/250 | 4/220 | 24–48/RT | 6/250 | 24–48/RT | 4/175 | 2/200 | 2/200 | 48/RT | 48/RT | 2/200 |
| Cured Properties | Temperature Resistance, °F | –76 / +572 | –76 / +600 | –103 / +572 | –76 / +572 | –67 / +572 | –85 / +400 | –85 / +400 | –67 / +266 | –58 / +392 | –67 / +400 | –67 / +365 | –67 / +365 | –67 / +248 | –40 / +430 | –85 / +400 | –67 / +400 | –67 / +400 | –67 / +400 | –67 / +350 | –67 / +325 | –67 / +250 |
| | Temperature Resistance, °C | –60 / +300 | –60 / +316 | –75 / +300 | –60 / +300 | –55 / +300 | –65 / +204 | –65 / +204 | –55 / +130 | –50 / +200 | –55 / +204 | –55 / +185 | –55 / +185 | –55 / +120 | –40 / +220 | –65 / +204 | –55 / +204 | –55 / +204 | –55 / +204 | –55 / +175 | –55 / +165 | –55 / +120 |
| | CTE, in/in/°F × 10 ^{–6} (°C) | 18 (33) | 48 (86) | 25 (45) | 94 (170) | 14 (25) | 33 (60) | 27 (49) | 32 (59) | 16 (29) | 18 (32) | 19 (34) | 19 (34) | 39 (70) | 9 (16) | 30 (54) | 19 (34) | 15 (28) | 18 (32) | 37 (66) | 43 (77) | 33 (60) |
| | Thermal Conductivity, Btu-in/hr-ft²-°F | — | — | 12.5 | — | — | 9.0 | — | — | — | — | 8.4 | 8.4 | 4.4 | — | — | — | 11.0 | — | — | — | — |
| | Tensile Shear Strength, psi² | 2,800 | 3,750 | 1,800 | 425 | 2,000 | 2,500 | 3,000 | 1,135 | 1,200 | 2,350 | 600 | 800 | 1,135 | 1,100 | 2,500 | 2,300 | 2,600 | 2,700 | 4,560 | 4,770 | 4,800 |
| | Flexural Strength, psi³ | 18,000 | ND | 15,500 | — | 13,600 | 11,400 | 10,200 | — | 8,000 | 11,800 | 12,300 | 12,300 | 14,100 | 13,800 | 12,000 | 13,400 | 14,100 | 16,000 | 13,500 | 12,000 | — |
| | Volume Resistivity, ohms-cm @ RT | 4.0 × 10¹⁴ | 1.0 × 10¹³ | 1.0 × 10⁵ | 2.0 × 10¹⁵ | 2.0 × 10¹⁵ | 1.0 × 10⁵ | 1.2 × 10¹⁴ | 2.0 × 10¹⁴ | 2.0 × 10¹⁴ | 1.0 × 10¹⁵ | 1.0 × 10¹⁶ | 1.0 × 10¹⁶ | 3.0 × 10¹⁵ | 3.8 × 10¹⁵ | ND | 1.0 × 10¹⁵ | 1.0 × 10¹³ | 2.0 × 10¹⁵ | 1.0 × 10¹⁵ | 3.0 × 10¹³ | 2.0 × 10¹⁴ |
| | Dielectric Strength, volts/mil | 450 | 300 | 50 | 550 | 450 | 80 | 440 | 380 | 860 | 460 | 480 | 480 | 460 | 460 | ND | 460 | 420 | 480 | 380 | 410 | 1,100 |
| | Dielectric Constant, 1.0 kHz | 3.01 | ND | ND | 3.3 | 4.8 | ND | 3.12 | 4.4 | 6 | 4.2 | 4.7 | 4.7 | 4.8 | 4.3 | ND | 4.7 | 6.5 | 6.8 | 3.5 | 4.3 | — |
| | Dissipation Factor | 0.01 | ND | ND | 0.02 | 0.0007 | ND | 0.01 | 0.03 | 0.04 | 0.04 | 0.01 | 0.01 | 0.014 | 0.004 | ND | 0.01 | 0.09 | 0.01 | 0.008 | 0.4 | — |
| | Chemical Resistance | Good | Excellent | Good | Good | Excellent | Excellent | Good | Excellent | Excellent | Good | Excellent | Excellent | Excellent | Excellent | Excellent | Good | Good | Very Good | Very Good | Good | Good |
| | Color | Amber | Black | Gray | Red | Beige | Gray | Amber | Gray | Clear | Light Gray | Black | Black | Black | Black | Gray | Rust Brown | Gray | Black | Milky Clear | Black | Off-White |
| | Hardness, Shore D | 89 | ND | 87 | 43 (Shore A) | 90 | 75 | 75 | 73 | 65 | 84 | 92 | 92 | 89 | 90 | 75 | 88 | 89 | 88 | 85 | 78 | 78 |
| | Cure Shrinkage, in/in⁴ | 0.01 | ND | 0.003 | 0.003 | 0.0031 | 0.002 | 0.002 | 0.009 | 0.008 | 0.004 | 0.003 | 0.003 | 0.003 | 0.0034 | 0.002 | 0.009 | 0.005 | 0.003 | 0.003 | 0.001 | 0.001 |

Reference Notes

- ¹ Epoxies mixed in a 1:1 ratio are available in 50ml dual barrel cartridges. Add “-C” to part number (eg. 568-C). Request 9700 mechanical dispenser, 9800 pneumatic dispenser or 9850 plunger. Also request 9905 3.5” or 9910 6” static mixing nozzles.
- ² Tested according to ASTM D1002-94. This is a standard test method for determining the shear strength of single lap-joint metal coupons in tension loading.
- ³ Tested according to ASTM D790, “Flexural Properties of Unreinforced and Reinforced and Electrically Insulating Materials, Method-L, Three Point Loading System”.
- ⁴ Linear shrinkage is measured using a ¾ lb casting mass.
- ⁵ Also available filled with aluminum oxide, inorganic black pigment or both. Part numbers are 526N-ALOX, 631-ALOX, 526N-BL, 631-BL, 526N-ALOX-BL, and 631-ALOX-BL.
- ⁶ Meets NASA outgassing requirements.

Application Notes

Surface Preparation: All surfaces must be free of oil, grease, dirt, corrosives, oxides, paint or other foreign matter. Sand blast or abrade non-porous surfaces, or etch using Aremco’s Corr-Prep™ CPR2000.

Mixing: Two component products should be mixed thoroughly prior to dispensing. For high viscosity systems each component can be preheated separately at 100–125 °F to facilitate mixing and dispensing. Use Aremco’s 9700 or 9800 50ml dispensing systems for precise mixing of two component products.

Application: In most cases, the adhesive should be applied to both surfaces maintain a glue line of less than 10 mils. After assembling the parts, pressure should be applied to the assembly to prevent warpage and reduce air entrapment. Refer to curing guidelines in the above property chart.

Abbreviations

- NA
Not Applicable
- ND
Not Determined
- RT
Room Temperature

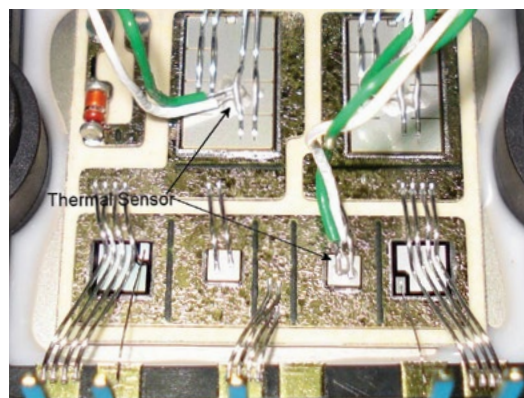
Aremco offers a broad range of electrically and thermally conductive adhesives & coatings that provide solutions to a variety of electrical, electronics and thermal design problems throughout industry.

PRODUCT HIGHLIGHTS

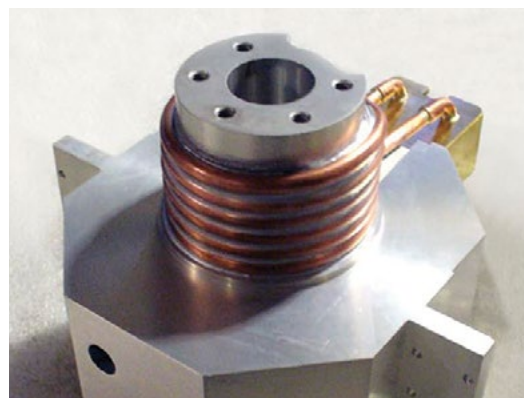
| Part Number | Adhesive/Coating | Filler | Conductivity | | Max Temp °F (°C) |
|-------------|------------------|------------------|--------------|---------|---------------------|
| | | | Electrical | Thermal | |
| 525-N | Adhesive | Silver | ✓ | ✓ | 340 (170) |
| 556 | Adhesive | Silver | ✓ | ✓ | 340 (170) |
| 556-LV | Adhesive | Silver | ✓ | ✓ | 340 (170) |
| 556-HT-HC | Adhesive | Silver | ✓ | ✓ | 390 (200) |
| 556-HT-UHC | Adhesive | Silver | ✓ | ✓ | 390 (200) |
| 556-HT-SP | Adhesive | Silver | ✓ | ✓ | 445 (230) |
| 568 | Adhesive | Aluminum | | ✓ | 400 (204) |
| 597-A | Adhesive | Silver | ✓ | ✓ | 1700 (927) |
| 597-C | Coating | Silver | ✓ | ✓ | 1700 (927) |
| 598-A | Adhesive | Nickel | ✓ | ✓ | 1000 (538) |
| 598-C | Coating | Nickel | ✓ | ✓ | 1000 (538) |
| 614 | Adhesive | Nickel | ✓ | ✓ | 360 (180) |
| 616 | Adhesive | Silver | ✓ | ✓ | 360 (180) |
| 805 | Adhesive | Aluminum | | ✓ | 572 (300) |
| 860 | Adhesive | Aluminum Nitride | | ✓ | 400 (204) |



Pyro-Duct™ 597-C metallizes ceramic tubes.



Aremco-Bond™ 556-HT-SP used to bond thermal sensor.



Aremco-Bond™ 568 bonds copper heat exchange tube to aluminum.

ELECTRICALLY & THERMALLY CONDUCTIVE ADHESIVES & COATINGS

| Properties | ADHESIVES | | | | | | | | | | | | | COATINGS | |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------|-----------------|-----------------------|------------------------|------------------------|-----------------------|------------------------|-----------------|-----------------|
| Product Number | 525-N | 556 | 556-LV | 556-HT-UHC | 556-HT-HC | 556-HT-SP | 597-A | 598-A | 568 ³ | 614 | 616 | 805 | 860 ³ | 597-C | 598-C |
| Resin type | Epoxy | | | | | | Ceramic | | Epoxy | | | | | Silicone | Ceramic |
| Filler | Silver Flake | Silver Flake | Silver Flake | Silver Flake | Silver Flake | Silver Flake | Silver Flake | Nickel Flake | Aluminum | Nickel Flake | Silver-Coated Glass | Aluminum | Aluminum Nitride | Silver Flake | Nickel Flake |
| Particle Size, microns | < 28 | < 20 | < 20 | < 20 | < 20 | < 44 | < 20 | < 20 | < 20 | < 20 | < 130 | < 50 | < 10 | < 20 | < 20 |
| No. Components | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| Mix Ratio, by Weight, resin:hardener | NA | 1:1 | 100:4 | 100:2 | 100:2 | 1:1 | NA | N/A | 1:1 | 1:1 | 1:1 | 100:12 | 1:1 | NA | NA |
| Mixed Specific Gravity, g/cc @ 25 °C | 1.85 | 3.2 | 2.9 | 3.7 | 3.1 | 3.1 | 2.3 | 2.8 | 0.85 | 1.8 | 1.53 | 1.66 | 1.90 | 2 | 1.5 |
| Mixed Viscosity, cP @ 25 °C | Paste | 35,000–40,000 | 4,000–6,000 | 40,000–50,000 | 40,000–45,000 | 35,000–45,000 | Paste | 20,000–25,000 | Paste | 100,000–110,000 | 50,000–60,000 | 11,000 | 40,000 | 400–800 | 400–600 |
| Pot Life, 25 gms @ 25 °C | NA | 1 Hr | 1 Hr | > 48 Hrs | 48 Hrs | > 48 Hrs | NA | N/A | 4.0 Hr | 0.75 Hr | 0.75 Hr | < 1.0 Hr | 4.0 Hr | NA | NA |
| Recommend Cure, hr/°F | 2/300 | 2/200 | 2/200 | 2/175 | 2/200 | 1/350 | 2/RT + 2/200 | 2/RT + 2/200 | 2/200 | 2/100 | 2/100 | 24/100 + 2/200 | 2/200 | 1/RT + .5/480 | 2/RT + 2/200 |
| Alternate Cure, hr/°F | 6/250 | 24/RT | 24/RT | 0.5/250 or 0.25/300 | 1/250 | 2/300 | — | — | 24–48/RT | 1/200 or 8/RT | 1/200 or 8/RT | 24/RT + 2/200 | 24–48/RT | — | — |
| Service Temperature, °F (°C) Continuous Intermittent | 340 (170) 375 (190) | 340 (170) 375 (190) | 340 (170) 375 (190) | 390 (200) 480 (250) | 390 (200) 480 (250) | 445 (230) 570 (300) | 1700 (927) — | 1000 (538) — | 400 (204) — | 360 (180) 400 (205) | 360 (180) 400 (205) | 572 (300) — | 400 (204) — | 1700 (927) — | 1000 (538) — |
| Volume Resistivity, ohm-cm | 0.006 | 0.0009 | 0.0008 | < 0.0003 | < 0.0001 | < 0.0004 | 0.0002 | 0.005 | 1.0 × 10 ⁵ | 0.025 | 0.002–0.004 | 1.0 × 10 ⁵ | 1.0 × 10 ¹⁵ | 0.0002 | 0.005 |
| Tensile Shear Strength, psi ² | 2,500 | 1,700 | 1,100 | > 1,000 | 1,700 | 1,400 | — | — | 2,500 | 2,500 | 1,000 | 1,800 | 1,375 | — | — |
| Thermal Conductivity, W/m-K | 2.1 | 2.2 | 2.2 | 12.4 | 2.2 | 3.5 | 9.1 | 2.6 | 1.3 | 0.5 | 0.4 | 1.8 | 1.2 | 9.1 | 2.6 |
| Hardness, Shore D | 76 | 72 | 84 | 90 | 90 | 88 | — | — | 75 | 78 | 78 | 87 | 75 | — | — |
| Color | Silver | Silver | Silver | Silver | Silver | Silver | Silver | Dark Gray | Gray | Dark Gray | Tan | Gray | Gray | Silver | Dark Gray |
| Shelf Life, months | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |

Reference Notes

¹ The low end of the service temperature range for all products is approximately –67 °F (–55 °C).

² Tested according to ASTM D1002-94 at 25 °C, a method for determining the shear strength of a single lap-joint of metal substrates in tensile loading.

³ Available as a faster-setting. Add “FSLV” (eg. 568-FSLV).

Application Notes

Surface Preparation: All surfaces must be free of oil, grease, dirt, corrosives, oxides, paint or other foreign matter. Sand blast or abrade non-porous surfaces, or etch using Aremco's Corr-Prep™ CPR2000.

Mixing: Two component products should be mixed thoroughly prior to dispensing. For high viscosity systems each component can be preheated separately at 100–125 °F to facilitate mixing and dispensing. Aremco-Bond™ 568 is available in 50ml cartridges. Order 568-C 50ml Cartridge, 9910 6" Mixing Nozzle and 9850 Plunger or 9700 Mechanical Dispense Gun.

Application: Apply adhesive to both surfaces maintaining a glue line of less than 10 mils. Assemble parts and apply pressure to prevent warpage and reduce air entrapment. Refer to curing guidelines in above property chart.

Abbreviations

NA Not Applicable
RT Room Temperature

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco's Heat-Away™ greases are ceramic and metal-filled systems that offer exceptional electrical and thermal properties up to 680 °F (360 °C). These materials are used in high power electronics, heat pipes, high vacuum systems, and other heat management applications.

PRODUCT HIGHLIGHTS

| Part Number | Filler | Conductivity | | Vacuum Compatible | Temp. Range °F (°C) |
|-------------|------------------|--------------|---------|-------------------|---------------------|
| | | Electrical | Thermal | | |
| 637 | Alumina | | ✓ | | 550 (288) |
| 638 | Aluminum Nitride | | ✓ | | 550 (288) |
| 639 | Aluminum | | ✓ | | 550 (288) |
| 640 | Copper | | ✓ | | 550 (288) |
| 641 | Silver | ✓ | ✓ | | 550 (288) |
| 641-EV | Silver | ✓ | ✓ | ✓ | 550 (288) |
| 641-HT-EV | Silver | ✓ | ✓ | ✓ | 680 (360) |



Heat-Away™ 639 coats process heater to improve thermal contact.

HEAT-AWAY™ THERMALLY CONDUCTIVE GREASES

| Product Number | 637 | 638 | 639 ⁽²⁾ | 640 ⁽²⁾ | 641 | 641-EV ⁽¹⁾ | 641-HT-EV ⁽¹⁾ |
|---|------------------|------------------|--------------------|--------------------|------------|-----------------------|--------------------------|
| Filler | Alumina | Aluminum Nitride | Aluminum | Copper | Silver | Silver | Silver |
| Temperature Resistance, °F | -60 / +550 | -60 / +550 | -60 / +550 | -60 / +550 | -60 / +550 | -60 / +550 | -23 / +680 |
| Temperature Resistance, °C | -51 / +288 | -51 / +288 | -51 / +288 | -51 / +288 | -51 / +288 | -51 / +288 | -5 / +360 |
| Thermal Conductivity, W/m-K | 0.475 | 2.23 | 3.04 | 4.68 | 5.58 | 5.58 | 5.58 |
| Dielectric Strength, volts/mil | 300 | 300 | 40 | 4 | 4 | — | — |
| Volume Resistivity, ohm-cm ⁽³⁾ | 10 ¹⁴ | 10 ¹⁴ | 10 ⁴ | 10 ³ | < 0.0002 | < 0.0002 | < 0.0006 |
| Chemical Resistance | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent | Excellent |
| Water Absorption | Nil | Nil | Nil | Nil | Nil | Nil | Nil |
| Solids, % | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Specific Gravity, g/cc | 2.42 | 2.27 | 1.35 | 1.33 | 3.90 | 4.30 | 4.20 |
| Color | White | Gray | Aluminum | Copper | Silver | Silver | Silver |

Reference Notes

⁽¹⁾ Heat-Away 641-EV and 641-HT-EV are electrically and thermally conductive greases rated for high vacuum systems.

| Temperature, °C (°F) | Vapor Pressure (Torr) | |
|----------------------|-----------------------|-------------------------|
| | 641-EV | 641-HT-EV |
| 20 (68) | 3 × 10 ⁻¹⁴ | ≤ 4 × 10 ⁻¹⁵ |
| 50 (122) | 2 × 10 ⁻¹² | Not Measured |
| 100 (212) | 1 × 10 ⁻⁹ | ≤ 2 × 10 ⁻¹⁰ |
| 200 (392) | 2 × 10 ⁻⁶ | ≤ 3 × 10 ⁻⁷ |

⁽²⁾ Caution: Exposure to voltages in excess of rated maximum may cause a permanent electrical leak path.

⁽³⁾ Volume resistivity is measured < 0.002" thick after exposure to 500 °F.

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco's Crystalbond™ mounting adhesives are ideal for temporarily mounting a range of materials that require dicing, polishing, and other machining processes. These mounting adhesives exhibit good bond strength and adhere readily to ceramics, glass, metals, and quartz. When processing is complete, these adhesives are removed by re-heating and cleaning with a suitable solvent.

PRODUCT HIGHLIGHTS

Crystalbond™ 509

Mid-range melting point of 165 °F (74 °C). Provides excellent adhesion and minimizes clogging of diamond tools when compared to many waxes. Transparent in thin cross-sections. Soluble in acetone or Aremco's proprietary **Crystalbond™ 509-S Stripper**, a low odor, non-flammable, biodegradable, water-rinsible solvent. Available in three standard colors and both round sticks and rectangular bars:

| | | |
|----------------------------|-------------|---------------------------------|
| Crystalbond™ 509-1A | Light Amber | Round Stick, 7/8" Dia × 7" |
| Crystalbond™ 509-1B | Light Amber | Rectangular Bar, 5/8" × 1" × 7" |
| Crystalbond™ 509-2A | Dark Amber | Round Stick, 7/8" Dia × 7" |
| Crystalbond™ 509-2B | Dark Amber | Rectangular Bar, 5/8" × 1" × 7" |

| | | |
|----------------------------|-----------------|---------------------------------|
| Crystalbond™ 509-3A | Clear Turquoise | Round Stick, 7/8" Dia × 7" |
| Crystalbond™ 509-3B | Clear Turquoise | Rectangular Bar, 5/8" × 1" × 7" |

Crystalbond™ 555

Low melting point of 120 °F (49 °C).

Crystalbond™ 555-HMP

Mid-range melting point of 150 °F (66 °C).

Use 555 and 555-HMP for low stress machining processes, dry plasma etching or silicon wafers, de-paneling copper plated Teflon boards, and dicing ceramic green tape. Transparent in thin cross-sections and soluble in hot water. Available in rectangular bars, 5/8" × 1" × 7".

Crystalbond™ 590

High melting point of 300 °F (150 °C). High strength, flexible adhesive, ideal for dicing high aspect ratios. Soluble in isopropyl alcohol or Aremco's proprietary **Crystalbond™ 590-S Stripper**, a water-dispersible, environmentally safe powder concentrate. Available in two standard forms:

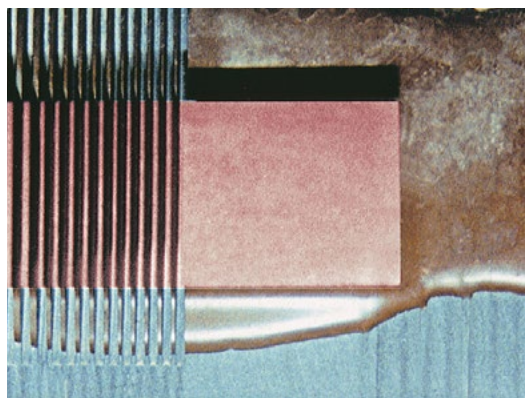
| | |
|-----------------------------|-----------------------------------|
| Crystalbond™ 590-STK | Rectangular Stick, 5/8" × 1" × 7" |
| Crystalbond™ 590-PDR | Granular Powder |



Crystalbond™ 509-1A, 509-2A, 509-3A



Crystalbond™ 555-HMP



Crystalbond™ 590 bonds Boron Carbide ceramic diced into 25–50 mil sections.

TYPICAL APPLICATIONS

- Machining advanced ceramics
- Lapping and polishing optical components
- Dicing ceramic substrates
- Dicing semiconductor wafers
- Dicing ferrites, glasses and piezoelectrics
- Dicing metal and optical single crystals
- Mounting cross-sections for SEM
- Backfilling components for support
- Dry plasma etching

CRYSTALBOND™ PRODUCT SPECIFICATIONS

| Part Number | 509 | 555 | 555-HMP | 590 |
|-----------------------|--|-----------------------|-----------------------|--|
| Flow Point, °F (°C) | 165 (74) | 120 (49) | 150 (66) | 300 (150) |
| Tensile Strength, psi | 1,160 ¹ | 220 | 335 | 950 ² |
| Solvent | 509-S or Acetone | Hot Water | Hot Water | 590-S or Isopropanol |
| Available Colors | 509-1 Light Amber 509-2 Dark Amber 509-3 Clear-Turquoise | White | White | Brown |
| Available Forms | Stick, 7/8" Dia x 7" Stick, 5/8" x 1" x 7" | Stick, 1/2" x 1" x 7" | Stick, 1/2" x 1" x 7" | 590-PDR Powder 590-STK 5/8" x 1" x 7" |
| Weight | 0.20 Lbs/Stick | 0.15 Lbs/Stick | 0.15 Lbs/Stick | 0.50 Lbs/Stick |

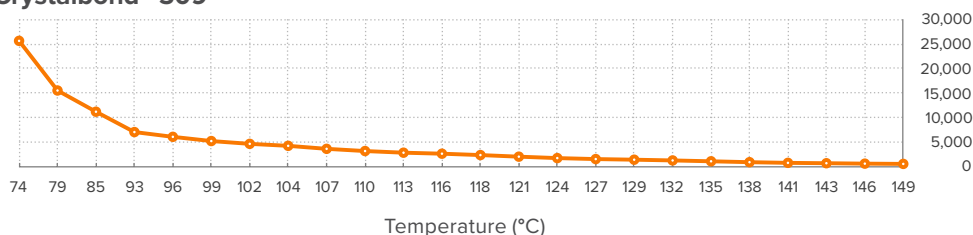
Reference Notes

¹ Crystalbond™ 509 tensile strength measured using a solution of 60 parts 509 and 40 parts Acetone by weight.

² Crystalbond™ 590 tensile strength measured using a solution of 36 parts 590 and 64 parts Isopropanol by weight.

CRYSTALBOND™ — VISCOSITY VS. TEMPERATURE

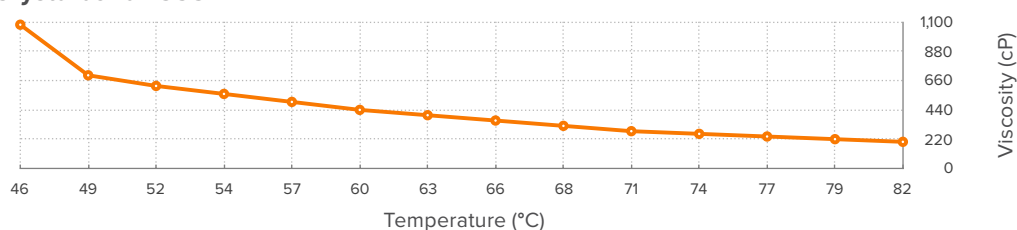
Crystalbond™ 509



#2 Spindle

@12 RPM used for viscosity < 2,500 cP,
@6 RPM for viscosity 2,500–5,000 cP,
@3 RPM for viscosity 5,000–7,500 cP,
@1.5 RPM for viscosity 7,500–15,500 cP,
@1 RPM for viscosity 15,500–26,000 cP.

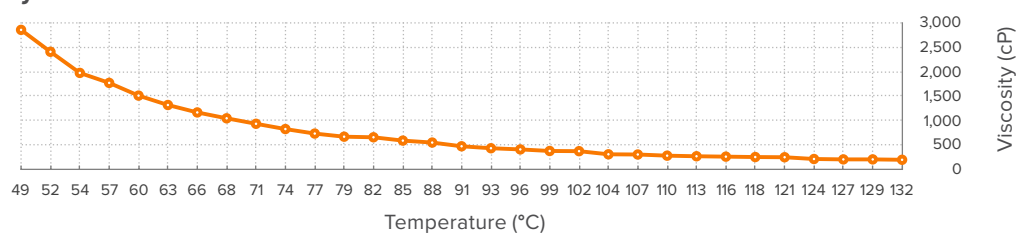
Crystalbond™ 555



#3 Spindle

@6 RPM used for viscosity < 1,100 cP.

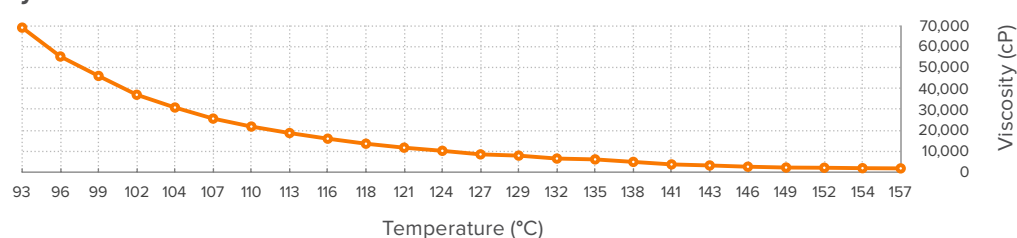
Crystalbond™ 555-HMP



#3 Spindle

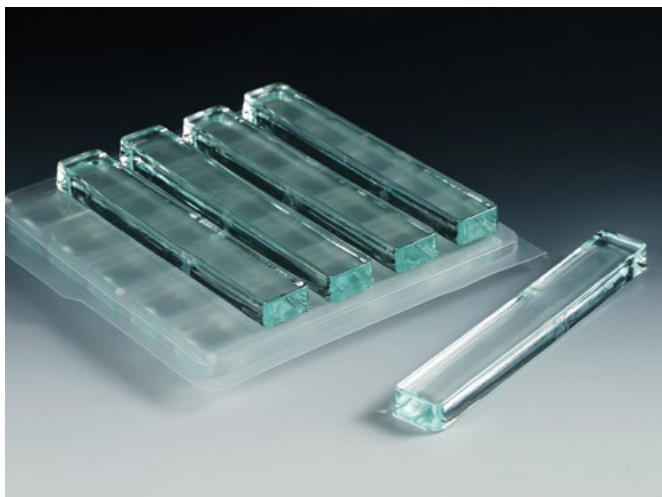
@30 RPM used for viscosity < 3,000 cP.

Crystalbond™ 590



#4 Spindle

@6 RPM used for viscosity < 55,500 cP,
@3 RPM for viscosity 55,500–70,000 cP.



Crystalbond™ 509-3B



Crystalbond™ 590

APPLICATION PROCEDURES

Crystalbond™ Adhesives | General Procedure

- 1) Using a hot plate or oven, heat a ceramic or glass mounting block to the flow temperature of the selected adhesive. Make sure to work in a well-ventilated area, and do not overshoot the flow temperature, otherwise, the adhesive will begin to decompose and polymerize, causing a reduction in strength.
- 2) Apply a uniform layer of adhesive to the heated mounting plate and place the substrate over the adhesive. Using a weight, apply even pressure to the substrate to remove air bubbles and to ensure that the substrate is parallel to the plate. Apply a fillet of the adhesive around the perimeter of the substrate to increase the holding strength.
- 3) Remove the mounting plate from the heat source and allow it to cool slowly to room temperature until the adhesive is hardened. Cool for 20–30 minutes before processing.
- 4) Process the substrate as required, then remove the parts by re-heating the mounting block to the flow temperature. Use a tool to remove the substrate from the mounting plate and follow Cleaning section.

Crystalbond™ 509 | Liquid Procedure

- 1) This adhesive can be applied in a thin, uniform film by dissolving and spin-coating, spraying or brushing onto the substrate. Simply crush the adhesive stick into a powder and mix with acetone in a ratio of 80 parts acetone to 20 parts 509 by weight.
- 2) Spin-coat, spray or brush the solution onto the parts and allow solvent to evaporate for a minimum of 5 minutes. A heat gun can be used to accelerate the evaporation rate.
- 3) Press parts together and heat to ~165 °F for 10–15 minutes, then cool to room temperature before processing.

Crystalbond™ 590-PDR | Liquid Procedure

- 1) Blend approximately 65 parts isopropyl alcohol and 35 parts 590-PDR powder by weight. Stir contents regularly to prevent settling of solids.
- 2) Apply a thin film of the mixture to both substrates to be bonded and evaporate solvents naturally or using an oven at ~250 °F for ~10 minutes. Remove from oven and allow to cool.
- 3) Clamp parts together and place in oven at 300 °F for ~30 minutes. Remove parts and allow to cool to room temperature before processing.

OPTIONAL CLEANING AGENTS

Crystalbond™ 509-S Stripper

This is a high performance, environmentally safe, non-ionic cleaning agent developed specifically for removing Crystalbond 509 and other polymer coatings and inorganic particulates.

Features

- Low Evaporation Rate
- Rinses with Water
- Non-Flammable
- Non-Reactive with Metals
- Biodegradable

Usage

509-S works best with an ultrasonic system at 120–140 °F (50–60 °C). The evaporation rate is much slower than acetone so a good lifecycle will be achieved in comparison. Replace 20% of the stripper with new material as adhesive residue begins to concentrate. Refer to process diagram for a suggested cleaning procedure.

Rinsing

A stepwise, warm rinsing process is recommended after removing the adhesive. Rinse in a dilute, non-ionic surfactant or liquid detergent system, followed by a final rinse in deionized water to eliminate water spots due to hard salts and contaminant re-deposition.

Compatibility

This cleaner is non-reactive with metals; however, it will react with many types of polymers and plastics such as elastomers and rubbers. Contact Aremco with any questions about compatibility.

Handling and Storage

This cleaner is readily biodegradable and non-toxic to marine life. The use of gloves and goggles is recommended. Respiratory protection or ventilation is recommended under normal handling. When heated, vapors should be ventilated from the work space. Keep container tightly closed and store in a cool, dry, well ventilated area or cabinet. Isolate from incompatibles such as corrosives, oxidizers, or strong reducing agents.

Crystalbond™ 590-S Stripper

This is an environmentally safe, water dispersible, powder concentrate prepared primarily for use with Crystalbond 590 and other mounting waxes. It can also be used to remove silicones, greases, oils, soils, finishing compounds, and normal contaminants.

Features

- Water Soluble
- Non-Reactive with Metals
- Biodegradable
- Non-Flammable

Usage

Add 6–8 ounces (170–225g) of 590-S powder concentrate to each gallon of water and allow to dissolve completely. Heat solution to 120–160 °F (50–70 °C) and immerse parts for a minimum of 5 minutes until the wax dissolves. Use an ultrasonic system for best results. Replace 20% of the stripper with new material as adhesive residue begins to concentrate in the stripper. Refer to process diagram for a suggested cleaning procedure.

Rinsing

A stepwise, warm rinsing process is recommended after removing the adhesive. Rinse in a dilute, non-ionic surfactant or liquid detergent system, followed by a final rinse in deionized water to eliminate water spots due to hard salts and contaminant re-deposition.

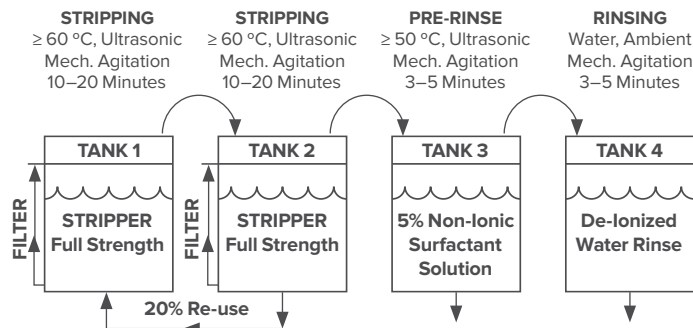
Compatibility

This stripper is non-reactive with ceramics, glass and metals such as brass, copper, iron, and silicon. It is reactive with strong acids.

Handling and Storage

This stripper is biodegradable and inert. It is a caustic material, so gloves and eye goggles should be used for personal protection. Keep container tightly closed and store in a cool, dry, well ventilated area or cabinet. Isolate from incompatibles such as strong acids.

Suggested Process Diagram For Cleaning



Refer to Price List for complete order information.

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Pyro-Tape™ 682 is a family of high temperature, high performance tapes used in a wide range of industrial applications for plasma spray masking, heat reflectivity and abrasion, chemical, and electrical resistance. Pyro-Tape™ products are available in rolls up to 1" wide as well as custom widths and preformed shapes.

PYRO-TAPE™ 682-TB THERMAL BARRIER CERAMIC TAPE

The new 682-TB tape is a woven silica fabric tape with temperature resistance as high as 2500 °F used to offer thermal insulation for pipes. The Pyro-Tape™ 682-TB has an adhesive backing which is used to ease wrapping around pipes. The adhesive will burn off at 275 °F, and then the tape is secured to the pipe in intervals with stainless steel wire.



Pyro-Tape™ 682-TB Heat Barrier Tape

PRODUCT SPECIFICATIONS

| Product | Tape Thickness | Tape Width | Thermal Conductivity ¹ BTU-in/hr-ft ² -°F | Silica Content | Roll Length |
|-----------|-----------------|------------|--|----------------|-------------|
| 682-TB1-1 | 0.030" / 0.76mm | 1" | 1.0 | > 96% | 150' |
| 682-TB1-2 | 0.030" / 0.76mm | 2" | 1.0 | > 96% | 150' |
| 682-TB1-4 | 0.030" / 0.76mm | 4" | 1.0 | > 96% | 150' |
| 682-TB2-1 | 0.054" / 1.37mm | 1" | 1.1 | > 96% | 75' |
| 682-TB2-2 | 0.054" / 1.37mm | 2" | 1.1 | > 96% | 75' |
| 682-TB2-4 | 0.054" / 1.37mm | 4" | 1.1 | > 96% | 75' |

Reference Notes

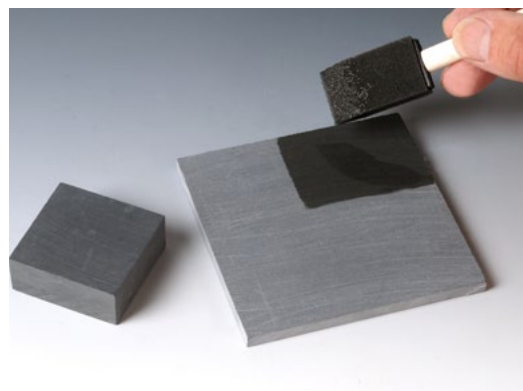
¹ Measured at a average temperature of 600 °F.

Refer to Price List for complete order information.

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Aremco's Ceramabind™ materials are unique inorganic, water-based binder systems used in the formulation of specialty adhesives, coatings, sealants and putties for applications to 3200 °F. The versatility of Aremco's Ceramabind™ products enables users to blend formulations using most ceramic, glass and metal-oxide powders. Specific properties such as coefficient of thermal expansion, thermal conductivity, dielectric strength, and chemical and moisture resistance can be optimized.



Ceramabind™ 542 seals porosity in ceramic plate.

PRODUCT HIGHLIGHTS

- 542** An acidic, etching solution which is ideal for use in adhesive systems for bonding non-porous ceramics and glass. Stable when mixed with copper. Reacts with bases such as carbonates, oxides and hydroxides of alkali metals.
- 642** A basic solution which is highly compatible with most ceramic and metal powders. Good wettability and tack, and excellent acid resistance after curing. Extremely moisture resistant after a high temperature cure. Sets up in thick cross-sections when properly formulated.
- 643-1** A basic solution compatible with most ceramic and metal powders. Excellent binder for producing high temperature protective coatings and refractory and chemically resistant adhesives and patching materials. Fully cures at low temperatures and sets up in thick cross-sections when properly formulated.
- 643-2** Similar to 643-1. Excellent for formulating thin coatings that set at room temperature and can be raised rapidly to high temperatures.
- 644-A** An acidic, colloidal alumina binder developed for mixing with sized refractory flours and grains to produce high temperature refractory coatings for ceramic fiber boards. Used as a superior standalone system to rigidize refractory fiber shapes.
- 644-S** A colloidal silica aqueous solution which produces high adhesive strength. Ideal for blending with all types of granular and fibrous ceramics. Excellent resistance to temperature, moisture and mechanical shock.
- 830** A basic solution compatible with most oxide and metal powders. Ideal for formulating high pigment-to-binder ratios to produce dense adhesives and coatings. Sets at room temperature to a moisture resistant film and does not require a heat cure. Use only for thin coating systems less than 1 mil thick.
- 875** An acidic powdered binder system used to formulate high strength, hydraulic-setting cements for electrical potting or molding applications. A powder blend is typically formulated by adding one part binder to four parts filler by weight. Water is then added in a ratio of 15–20 parts to 100 parts powder blend by weight.
- 880** High temperature, water-dispersible silicone resin for producing corrosion and moisture resistant coatings and sealing porous ceramics.

TYPICAL PRODUCT SPECIFICATIONS

| Product | 542 | 642 | 642A | 643-1 | 643-2 | 644-A | 644-S | 830 | 875 | 880 |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------------|
| pH | 2.5 | 10.7 | 10.7 | 11.0 | 11.5 | 4.0 | 9.0 | 11.4 | 2.8 | 6.5 |
| Specific Gravity, g/cc | 1.47 | 1.41 | 1.25 | 1.26 | 1.27 | 1.23 | 1.40 | 1.20 | 1.36 | 1.04 |
| Viscosity, cP | 50 | 370 | 200 | 60 | 30 | 7 | 35 | 10 | NA | 480 |
| Solids Content, % by weight | 40 | 40 | 25 | 30 | 30 | 30 | 40 | 25 | 100 | 50 |
| Temperature Resistance, °F (°C) | 3200 (1760) | 3000 (1650) | 3000 (1650) | 3000 (1650) | 3000 (1650) | 3000 (1650) | 3200 (1760) | 2000 (1093) | 3000 (1650) | 1200 (650) |

APPLICATION GUIDELINES

Mixing & Application

1. Liquid binder-to-powder weight ratios of 4:1 to 1:1 are recommended when formulating adhesives, coatings and pastes. Powder binder (875) to filler ratio of 1:4 is recommended.
2. Blend powder slowly into binder until desired viscosity is achieved. Vacuum degas as required to reduce entrapped air.
3. Apply mixture to clean surfaces. Extremely smooth surfaces are difficult to wet and should be sandblasted, etched, or slightly oxidized wherever possible. Porous substrates tend to absorb and separate the binder from the powder; these substrates should be pre-coated with the binder only prior to applying the mixture.

Curing

Ceramabind™ 542

1. Air dry at room temperature for 1–2 hours.
2. Heat cure at 200 °F for 1–2 hours.
3. Heat cure at 500 °F for 1–2 hours.
4. Final cure at 700 °F for 1 hour for maximum adhesive strength and moisture resistance.

Ceramabind™ 642, 642A, 643-1, 643-2

1. Air dry at room temperature for 1–2 hours.
2. Heat cure at 200 °F for 2–4 hours.
3. Heat cure at 350 °F for 1–2 hours.
4. Final cure at 500 °F for 1 hour.

Ceramabind™ 644-A, 644-S

1. Air dry at room temperature for 2–4 hours.
2. No heat cure is required if substrate is ramped slowly at ~200 °F per hour to the operating temperature.

Ceramabind™ 830

1. Air dry at room temperature for 1–2 hours.
2. No heat cure is required.

Ceramabind™ 875

1. Air dry at room temperature for 1–2 hours.
2. Heat cure at 200 °F for 2–4 hours.
3. Final cure at 250 °F for 2–4 hours.
4. Note: This binder can also be set at room temperature in 16–24 hours without heat curing.

Ceramabind™ 880

1. Air dry at room temperature for 1–2 hours.
2. Final cure at 450 °F for 1 hour or 480 °F for 45 minutes.

Storage

Unopened containers have a six-month shelf life when stored at room temperature. Make sure opened containers are capped securely to prevent evaporation. Place a plastic film in between the cap and container to prevent air leakage. Store containers between 45 °F and 95 °F.

CERAMABIND™ COMPATIBILITY CHART

| Product | 542 | 642 / 642A | 643-1 / 643-2 | 644-S | 644-A | 830 | 875 | 880 |
|--------------------|-----|------------|---------------|-------|-------|-----|-----|-----|
| Aluminum | R | S | R | S | R | S | R | S |
| Aluminum Oxide | S | S | S | S | S | S | S | S |
| Aluminum Nitride | R | S | S | S | S | S | S | S |
| Boron Nitride | S | S | S | R | S | S | S | S |
| Brass | S | S | S | S | S | S | R | S |
| Bronze | S | S | S | S | S | S | R | S |
| Chromium | R | S | S | S | S | S | R | S |
| Cobalt | R | S | S | S | S | S | R | S |
| Copper | S | R | S | S | S | S | R | S |
| Dolomite | S | S | S | S | S | S | S | S |
| Inconel | S | S | S | S | S | S | S | S |
| Indium | S | S | S | S | S | S | R | S |
| Indium Oxide | S | S | S | S | S | S | R | S |
| Invar | S | S | S | S | S | S | S | S |
| Iron | R | S | S | S | S | S | R | S |
| Iron Oxide | R | S | S | S | S | S | S | S |
| Magnesium Oxide | R | S | S | R | S | S | R | S |
| Manganese Dioxide | S | S | S | S | S | S | R | S |
| Mica | S | S | S | S | S | S | S | S |
| Molybdenum | R | S | S | S | S | S | S | S |
| Mullite | S | S | S | S | S | S | S | S |
| Neodymium Oxide | R | S | S | S | S | S | R | S |
| Nickel | R | S | S | S | R | S | R | S |
| Nichrome | S | S | S | S | S | S | R | S |
| Silicon Dioxide | S | S | S | S | S | S | S | S |
| Silicon | S | S | S | S | S | S | R | S |
| Silicon Carbide | R | S | S | R | S | S | S | S |
| Stainless Steel | R | S | S | R | S | S | S | S |
| Tantalum | R | S | S | R | S | S | S | S |
| Titanium | R | S | S | R | S | S | S | S |
| Titanium Diboride | R | R | R | S | S | S | R | S |
| Titanium Dioxide | S | S | S | R | S | S | S | S |
| Zinc | S | S | S | R | S | S | R | S |
| Zirconium Carbide | R | S | S | S | S | S | S | S |
| Zirconium Diboride | R | S | S | S | S | S | S | S |
| Zirconium Oxide | S | S | S | S | S | S | S | S |
| Zirconium Silicate | S | S | S | S | S | S | S | S |

Key

S = Stable R = Reacts

Safety

Read Material Safety Data Sheet carefully prior to use. All Ceramabind™ products are water-based materials which can be washed from the skin, in the uncured state, with mild soap and warm water. Prolonged skin contact should be avoided to prevent irritation. If any material contacts the eyes, flush continuously with water or neutralizing solutions, then consult a physician immediately.

Refer to Price List for complete order information.

Aremco Products makes no warranty express or implied concerning the use of this product.

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.

Aremco offers a good selection of mechanical and pneumatic dispensing tools which are tailored for its ceramic and epoxy-based products.

TOOLS FOR ONE-COMPONENT CERAMIC SYSTEMS

Syringe and cartridge-style systems can be used with Aremco's ceramic and ceramic metallic high-temperature systems.

Two standard 30cc syringes are offered, one for manual use, the other for use with a mechanical dispense gun.

A standard 6 oz. (173cc) high density polyethylene cartridge with ¼ NPT female threads is also offered. Manual and pneumatic hand guns, and plastic and stainless steel needles are also provided.

All metal and plastic components are easily reused since Aremco's ceramic and ceramic-metallic products are all water-based systems.

Syringe Options

- 8000 30cc Manual Syringe with Plunger and Tip Cap
- 8100 Squeeze Bottle, 9 oz.

- 8200 30cc Mechanical Syringe Gun
- 8201 30cc Barrel, Plunger and Tip Cap Kit
- 8202 30cc End Cap

Cartridge Options

- 8500 Manual Hand Gun
- 8510 Pneumatic Hand Gun
- 8515 6 oz. Cartridge
- 8516 Plunger
- 8517 Rear Cap
- 8518 Tip Cap

Plastic Nozzles, ¼ NPT

- 8525 ⅛" Orifice, 4.0" Long
- 8530 ⅜" Orifice, 4.0" Long

Stainless Steel Needles, ¼ NPT × 2.5" Long

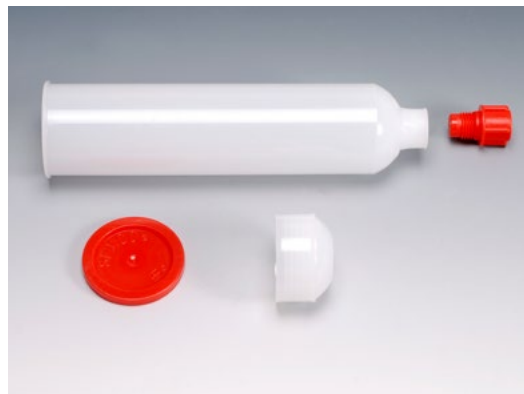
- 8535 8 Gauge (0.128")
- 8540 10 Gauge (0.102")
- 8545 12 Gauge (0.081")
- 8550 14 Gauge (0.064")



8200 30cc Dispense Gun



8500 6 oz. Dispense Gun



851X 6 oz. Cartridge, Plunger, End Cap & Tip Cap



8535, 8540, 8545, 8550
Stainless Steel Needles



992X Nozzle Adapter
and Needles

TOOLS FOR TWO-COMPONENT EPOXY SYSTEMS

A standard 50ml dual barrel cartridge is offered for Aremco's High Performance 1:1 Epoxy Systems. Most 1:1 products described in Technical Bulletins A7 and A8 are offered in pre-packaged 50ml cartridges. Part numbers for dispense guns, nozzles and needles are provided below.

9700 Mechanical Dispense Gun

9850 Hand-Held Plunger

9900 Un-Filled Dual Barrel Cartridge (25ml/barrel)
Including (2) Pistons and Tip Cap

9905 Static Mixing Nozzle, 3.5"

9910 Static Mixing Nozzle, 6.0"

9920 Mixer-Needle Adapter

9921 Needle, .063" ID x 1/2" L

9922 Needle, .047" ID x 1/2" L

9923 Needle, .033" ID x 1/2" L

9924 Needle, .023" ID x 1/2" L

9925 Needle, .016" ID x 1/2" L

9926 Needle, .010" ID x 1/2" L

Larger cartridge sizes including 75ml, 200ml and 400ml are available upon request.



9700 50ml Dispense Gun

MIXER FOR ONE- AND TWO-COMPONENT SYSTEMS

Aremco offers the Model 7000 low-cost, heavy duty, air operated mixer ideal for mixing pint, quart and gallon containers.

PRODUCT HIGHLIGHTS — MODEL 7000

- Easy to Setup
- Heavy Duty Construction
- Compact Design
- Rubber Coated Clamps to Accommodate Pint, Quart & Gallon Containers
- Air Operated
- Rapid Mixing for Adhesives & Coatings (Typically 1–2 Minutes)
- Includes Oiler



Model 7000 Mixer

PRODUCT SPECIFICATIONS — MODEL 7000

| | |
|-----------------|--------------------|
| Capacity | 1.0 Gallon |
| Air Inlet | 1/4" NPT |
| Air Consumption | 1.35 CFM |
| Air Pressure | 90–120 PSI |
| Speed | 1400 Cycles/Minute |

Refer to Price List for complete order information.

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Aremco's Accu-Coat™ Screen Printers offer the finest technology for precision screening of electronic components and other materials up to 24". Accu-Coat™ printers represent the best price/performance ratio throughout the industry, providing the most accurate, reliable and cost effective solution for your screen printing needs.

TYPICAL APPLICATIONS

- Co-Fired Ceramic Packages
- Multilayer Hybrid Circuits
- Liquid Crystal Displays
- SMT Boards
- Piezoelectric Thick Film Devices
- Thick Film Resistors & Capacitors
- Silicon Solar Cells
- Ceramic Brazing
- Instrument Panels
- Flexible Circuits

PRODUCT HIGHLIGHTS

Print Repeatability

Each Accu-Coat™ Screen Printer is based on a high precision two- or four-post die set which positions the print head directly above the part. The print head travels to and from the work in a single axis with a print repeatability of $\pm 0.0003"$, guaranteed over millions of cycles. An additional attribute of this design is that both substrates and tall parts such as ceramic rings and tubes can be accommodated since a clearance of 6"—8" between the print head and stage is provided.

Alignment and Registration

Part-to-screen alignment is accomplished using a precision x-y-theta stage with 2" x-y travel and 360° rotation. The theta adjustment is centered to the stage as opposed to competitive models which pivot the part about a corner requiring multiple x-y adjustments before setup is complete.

A low cost optic alignment system is also offered. With this option, during setup the ink is first printed on a sheet of mylar which is supported by an adjustable metal frame above the substrate. The operator then aligns the fixtured board to the printed pattern on the mylar sheet using the stage controls. A 10x or 20x magnification camera and monitor system is also provided to enhance the image when making critical alignments required for fine-pitch SMT boards or hybrid circuits. Multi-camera and split-monitor alignment systems are also available.

On & Off-Contact Printing

Both screens and stencils can be utilized with the Accu-Coat™ printers. Screens are used for off-contact printing where the squeegee deflects the screen in order to contact the substrate. Stencils are used for on-contact printing in which case the stencil is in direct contact with the substrate. In both on- and off-contact printing, the distance between the screen or stencil and the substrate is controlled easily to within .0005" using a "Z-stop" mechanism.

Controls

Accu-Coat™ screen printers are truly simple machines to operate. The user interfaces with the equipment through an easy-to-use control panel which provides five modes of operation. All modes are pre-programmed into a microprocessor. Modes include setup, print-flood, flood-print, and single and double print with paste hopover.



Accu-Coat™ Model 3230-D semi-automatic screen printer with microprocessor based controls and optic alignment system with a maximum 9" x 9" print area.



Vidalign™ 129-131 Optic Alignment System.



Accu-Coat™ Model 3230-B bench-top screen printer.

When switched to Setup mode, the user can independently control each drive cylinder in order to set snap-off distance, squeegee pressure, print speeds and print limits. These setup controls are described as follows:

Print Head Up-Down This is used to set the snap-off distance.

Squeegee Up-Down This is used to set the squeegee downstop (screen deflection) and squeegee pressure.

Squeegee Forward-Away This is used to set the squeegee travel limits and squeegee speed.

Vacuum On-Off This is used for temporary part hold down.

All automatic modes of operation are software-defined and custom print modes and alternative delays are easily provided. Various options such as a squeegee speed timer, multiprint mode (primarily used for co-fired ceramic via-filling applications) and cycle counter are also available.

Reliability

Accu-Coat™ Screen Printers are extremely rugged tools utilizing reliable industrial components and modern controls. A detailed user manual and diagnostics are provided with every shipment. Most of all, Aremco enjoys a three decade history of screen printer manufacturing and over 1,000 units in the field in Europe, Asia, Middle East, Canada, Australia, and throughout the USA.

ACCU-COAT™ SCREEN PRINTER SPECIFICATIONS

| Accu-Coat™ Model | 3230-BL | 3230-B | 3230-D | 3240 | 3260 |
|--------------------------|--|---|---|--|--|
| Max Print Area | 9" x 9" | 9" x 9" | 9" x 9" | 14" x 14" | 20" x 20" |
| Screen Frame ID | 12" x 12" | 12" x 12" | 12" x 12" | 16" x 16" | 24" x 24" |
| Frame Mounts | 13" x 13" | 13" x 13" | 13" x 13" | 17.5" x 17.5" | 26" x 26" |
| Max Part Height | 6" | 6" | 6" | 8" | 8" |
| Print Repeatability | ± 0.0003" | ± 0.0003" | ± 0.0003" | ± 0.0003" | ± 0.0003" |
| Snap-Off | On & Off Contact Printing | On & Off Contact Printing | On & Off Contact Printing | On & Off Contact Printing | On & Off Contact Printing |
| | Single-Point Micrometer Z-Control with 0.001" Dial Indicator Readout | Single-Point Micrometer Z-Control with 0.001" Dial Indicator Readout | Single-Point Micrometer Z-Control with 0.001" Dial Indicator Readout | Three-Point Micrometer Z-Control with 0.001" Dial Indicator Readout | Three-Point Micrometer Z-Control with 0.001" Dial Indicator Readout |
| Control System | Pneumatic ¹ | Microprocessor | Microprocessor | Microprocessor | Microprocessor |
| Control Modes | Independent Pneumatic Switches for Squeegee Up/Down, Print Head Up/Down & Print Drive In/Out | Setup, Print/Flood, Flood/Print, Single & Double Print with Hopover | Setup, Print/Flood, Flood/Print, Single & Double Print with Hopover | Setup, Print/Flood, Flood/Print, Single & Double Print with Hopover | Setup, Print/Flood, Flood/Print, Single & Double Print with Hopover |
| Control Options | Not Applicable | Cycle Counter, Squeegee Speed Timer, Multiprint | Cycle Counter, Squeegee Speed Timer, Multiprint | Cycle Counter, Squeegee Speed Timer, Multiprint | Cycle Counter, Squeegee Speed Timer, Multiprint |
| Squeegee Drive | Hydraulic, Variable Speed Control 0–15 IPS | Hydraulic, Variable Speed Control 0–15 IPS, Optional Electric Drive | Hydraulic, Variable Speed Control 0–15 IPS, Optional Electric Drive | Electric Drive, Variable Speed Control 0–12 IPS | Electric Drive, Variable Speed Control 0–12 IPS |
| Squeegee Type | Free-Floating 9.5" Squeegee Holder with 3/8" Square Blade and Flood Bar | Free-Floating 9.5" Squeegee Holder with 3/8" Square Blade and Flood Bar | Free-Floating 9.5" Squeegee Holder with 3/8" Square Blade and Flood Bar | Free-Floating 14.0" Squeegee Holder with 3/8" Square Blade and Flood Bar | Free-Floating 22.5" Squeegee Holder with 3/8" Square Blade and Flood Bar |
| Options | X-Y-Theta Stage, Vacuum Manifolds, Vacuum Pumps, Optic Alignment | X-Y-Theta Stage, Vacuum Manifolds, Vacuum Pumps, Optic Alignment | X-Y-Theta Stage, Vacuum Manifolds, Vacuum Pumps, Optic Alignment | X-Y-Theta Stage, Vacuum Manifolds, Vacuum Pumps, Optic Alignment | X-Y-Theta Stage, Vacuum Manifolds, Vacuum Pumps, Optic Alignment |
| Dimensions (L x W x H) | 32" x 24" x 40" | 32" x 24" x 40" | 40" x 30" x 64" | 40" x 30" x 64" | 48" x 38" x 64" |
| Approx. Net Weight (lbs) | 150 | 175 | 325 | 450 | 850 |
| Service | No Electricals Required; 80–100 PSI at 5 CFM | 110 VAC, 60 Hz, 5A or 220 VAC, 50 Hz, 3A; 80–100 PSI at 5 CFM | 110 VAC, 60 Hz, 5A or 220 VAC, 50 Hz, 3A; 80–100 PSI at 5 CFM | 110 VAC, 60 Hz, 5A or 220 VAC, 50 Hz, 3A; 80–100 PSI at 5 CFM | 110 VAC, 60 Hz, 5A or 220 VAC, 50 Hz, 3A; 80–100 PSI at 5 CFM |

Reference Notes

¹ Pneumatic control system can be upgraded to a Microprocessor system if semi-automatic controls are required at a later date.

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.

Aremco offers a complete line of electric box furnaces from 0.5 to 7.5 cubic feet for applications to 2350 °F. All furnaces are ruggedly constructed and energy efficient, and a wide range of temperature controls are offered for every type of use. Custom features and sizes are also available upon request.

PRODUCT HIGHLIGHTS

- All furnaces are built with 3" premium insulating firebrick and 1" fiber board to permit rapid firing.
- Elements are protected in dropped recessed side wall grooves to provide even heating, longer life, and easy replacement.
- Outer shells are constructed using stainless steel to improve the casing resistance to high temperatures.
- Front-loading and top-loading door styles are offered.
- Alternate power requirements for domestic and international use are easily accommodated.
- Replacement elements are available on a just-in-time basis.
- User-friendly programmable controller.

TYPICAL APPLICATIONS

- | | |
|----------------------|--------------------------------|
| • Ash Determinations | • Thermal Cycling |
| • Assaying | • Carbon & Sulphur Tests |
| • Tempering | • Cement Tests |
| • Hardening | • Glass & Enamel Tests |
| • Heat Treating | • Jominy Hardness Tests |
| • Glass Annealing | • Petroleum Tests |
| • Melting | • Powder Metallurgy |
| • Fusions | • Thermocouple Standardization |
| • Dry Precipitates | • Ceramic Tests |
| • Curing Plastics | • Ignitions |

TEMPERATURE CONTROLLER

All Econo-Heat™ furnaces are built using the Sentry Xpress 4.0 Temperature Controller by Orton. This controller is a 3-button, 4-segment LED controller that provides 5 built-in speed settings (ramp rate) and the capability to store up to 4 programs with a maximum of 8 segments per program. This flexible, user-friendly controller enables quick and easy programming by the operator.

OPTIONS

Econo-Heat™ furnaces can be modified to include useful features such as view ports, entry holes, or gas intake and exhaust fittings. Larger area and ultra-high temperature furnaces are also available. Contact Aremco's sales engineering department to discuss your requirements.



Econo-Heat™ 2928 Furnace. This model has a work area of 13" x 13 1/2" x 8 3/4" and is equipped with a single set point analog temperature controller.



The Econo-Heat™ furnace shown is a custom unit designed for an aerospace manufacturer for use in heat treating. This furnace has a work area of 42" x 42" x 65", and a unique temperature control system consisting of 21 elements each with its own infinite control switch to permit uniform heating of complex shapes.



Econo-Heat™ 2931 Top-Loading Furnace. This model has a work area of 17" x 20" x 17" and is capable of 2400 °F operation using single phase service, 240 Volts and 40 Amps.

ECONO-HEAT™ 2900-SERIES FURNACE SPECIFICATIONS

| Model No. | Size (W"x D" x H") | | Style | | Power | | | Maximum Temp. °F (°C) | Approx. Weight (lbs) | Heating Elements Per Unit |
|-----------|--------------------|-------------------|------------|----------|-------|-----|-------|--------------------------|-------------------------|------------------------------|
| | ID | OD (Approx) | Front Load | Top Load | Volts | Amp | Phase | | | |
| 2927 | 8.5 × 9 × 8.75 | 16.5 × 17 × 21.75 | X | | 120 | 15 | 1 | 2350 (1288) | 80 | 2 |
| 2928 | 13 × 13.5 × 8.75 | 21 × 21.5 × 21.75 | X | | 240 | 15 | 1 | 2350 (1288) | 110 | 2 |
| 2929 | 22 × 22 × 13.5 | 30 × 30 × 26.5 | X | | 240 | 45 | 1 | 2350 (1288) | 295 | 3 |
| 2930 | 15 × 18 × 15 | 29.5 × 29 × 29 | | X | 240 | 30 | 1 | 2350 (1288) | 280 | 4 |
| 2931 | 17 × 17 × 20 | 31 × 31 × 31 | | X | 240 | 40 | 1 | 2350 (1288) | 300 | 4 |
| 2932 | 21.5 × 21.5 × 24.5 | 31 × 36 × 35 | | X | 240 | 45 | 1 | 2350 (1288) | 410 | 5 |

Refer to Price List for complete order information.

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