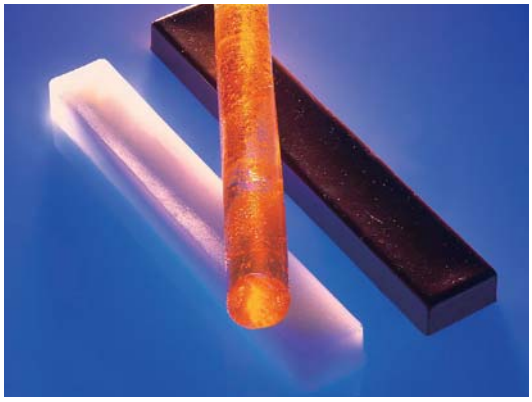
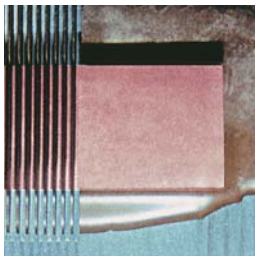
AREMCO

MOUNTING ADHESIVES & ACCESSORIES
Technical Bulletin A9

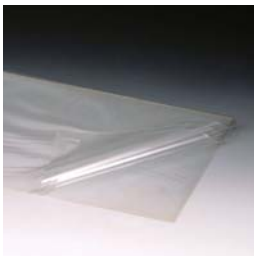
Aremco's Crystalbond™ and Wafer-Mount™ washaway adhesives are ideal materials for temporarily mounting products that require dicing, polishing, and other machining processes. These adhesives exhibit high bond strength and adhere readily to metals, glass and ceramics by simply melting with heat. When processing is complete, these adhesives are removed by reheating and cleaning with one of Aremco's environmentally-friendly cleaning agents.



Crystalbond™ 509, 555 and 590.



Crystalbond™ 590 bonds an advanced ceramic which is diced into 25–50 mil sections.



Wafer-Mount™ 562, a film adhesive, provides a uniform glue line between a ceramic substrate and mounting block.

PRODUCT HIGHLIGHTS

Crystalbond™ 509
Provides excellent adhesion and minimizes clogging of diamond tools compared to waxes. Transparent in thin cross-sections. Soluble in 509-S stripper, an odorless, non-flammable, biodegradable water-rinsable solvent. Available in three standard colors: 509-1 Light Amber, 509-2 Dark Amber, 509-3 Clear-Blue.

Crystalbond™ 555 & 555-HMP
Low melting point adhesive systems for moderate-stress machining processes, dry plasma etching of silicon wafers, de-paneling copper plated Teflon boards, and dicing ceramic green tape. Transparent in thin cross-sections. Soluble in hot water.

Crystalbond™ 590
High strength, resilient adhesive system, ideal for dicing miniature and tall parts. Soluble in isopropyl alcohol or 590-S stripper, a water-dispersible, environmentally-safe powder concentrate.

Wafer-Mount™ 559
Semi-rigid, solvent-resistant plastic film with pressure sensitive soluble adhesive layer. Ideal for scribing wafers with vacuum hold down fixturing.

Wafer-Mount™ 562
Thermoplastic film adhesive with good adhesive properties. Ideal for mounting thin, fragile substrates for which a predictable film thickness is required. Soluble in 562-S stripper, a non-flammable, biodegradable, water-rinsable solvent.

TYPICAL APPLICATIONS

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

PRODUCT SPECIFICATIONS

Product Number	509-1	509-2	509-3	555	555-HMP	590	559	562
Trade Name	Crystalbond™						Wafer-Mount™	
Form	Stick	Stick	Stick	Stick	Stick	Stick	Sheet	Sheet
Size	⅞″ Dia × 7″	⅞″ Dia × 7″	⅞″ Dia × 7″	½″ × 1″ × 7″	½″ × 1″ × 7″	⅝″ × 1¼″ × 7½″	0.005″ × 10″ × 10″	0.002″ × 8″ × 10″
Weight	~ 0.2 Lbs/Stick	~ 0.2 Lbs/Stick	~ 0.2 Lbs/Stick	~ 0.15 Lbs/Stick	~ 0.15 Lbs/Stick	~ 0.5 Lbs/Stick	NA	NA
Flow Point, °F (°C)	165 (74)	165 (74)	165 (74)	120 (49)	150 (66)	302 (150)	NA	200 (93)
Viscosity, cP	6,000	6,000	6,000	500	500	9,000	NA	NA
Color	Light Amber	Dark Amber	Clear-Blue	White	White	Brown	Clear	White
Solvent	509-S or Acetone	509-S or Acetone	509-S or Acetone	Hot Water	Hot Water	590-S or Isopropyl Alcohol	Acetone or Methy Ethyl Ketone	562-S

APPLICATION PROCEDURES

Crystalbond™ 509*, 555, 555-HMP, 590

1. Using a hot plate or oven, heat a ceramic or glass mounting block to the flow temperature of the selected Crystalbond™ adhesive. Make sure to work in a well-ventilated area, and do not overshoot the flow temperature, otherwise, the adhesive will begin to decompose, degrading its 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 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. Dice or process the substrate as required, then remove the parts by re-heating the mounting block to the flow temperature. Use a tool to slide the substrate off the mounting plate.
5. For detailed cleaning procedures for Crystalbond™ 509 and 590, refer to the section on Crystalbond™ 509-S and 590-S Strippers. For Crystalbond™ 555 or 555-HMP, follow the Process Diagram for cleaning, substituting water for the other strippers.

*Crystalbond™ 509 can be applied as a thin, uniform film by dissolving it into a sprayable liquid. This can be accomplished by crushing the adhesive stick into a powder and mixing it into a solution of 80 parts acetone to 20 parts 509 by weight. Spray the solution onto the parts and allow the solvent to evaporate for a minimum of 5 minutes. Use a heat gun for one minute at less than 250 °F to evaporate further, then press the parts together and cool at room temperature for at least 30 minutes.

Wafer-Mount™ 559

1. Cut the Wafer-Mount™ sheet to the desired shape and size and peel the clear plastic adhesive tape away from the backing paper. Place the substrate, face down, on the backing paper then place the plastic adhesive tape, with the adhesive side down, over the part. Press firmly to assure good adhesion, then peel off the backing paper.
2. Process the substrate as required, then remove parts by heating in a well-ventilated area to 300 °F for 2–3 minutes until the adhesive softens. Use a tool to slide the substrate off the mounting plate.
3. Clean with acetone or MEK according to the process diagram for cleaning.

Wafer-Mount™ 562

1. Cut the Wafer-Mount™ sheet to the desired shape and size, and position on a ceramic or glass mounting plate. Use multiple preforms as required to fill in small cavities or gaps caused by warping of the substrate.
2. Using a hot plate or oven, heat the mounting plate to 195–210 °F. Make sure to work in a well-ventilated area, and do not overshoot the flow temperature, otherwise, the adhesive will begin to decompose and degrade in strength.
3. Using a weight, apply even pressure to the substrate to remove air bubbles and to ensure that the substrate is parallel to the plate.
4. 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 prior to processing.
5. Process the substrate as required, then remove parts by re-heating the mounting block to the flow temperature. Use a tool to slide the substrate off the mounting plate.
6. For detailed cleaning procedures, refer to the section describing the 562-S Stripper.

APPLICATION PROCEDURES

Crystalbond™ 590-S Stripper

This stripper is an environmentally-safe, water-dispersible, powder concentrate prepared primarily for use with Crystalbond™ 590 and other mounting waxes. In addition to its ability to dissolve waxes, it can be used for the removal of silicones, greases, oils, soils, finishing compounds and normal contaminants.

Features

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

Usage

Add 6–8 ounces of 590-S (170–225 grams) to each gallon of water and allow to dissolve completely. Heat solution to 50–70 °C and immerse parts for a minimum of 5 minutes until the Crystalbond™ 590 dissolves. Use an ultrasonic system for best results. As adhesive residue begins to concentrate in the stripper, 20% of the stripper should be replaced with fresh material. Refer to process diagram for cleaning.

Rinsing

After removing the adhesive, a step-wise, warm-rinsing process is recommended. Rinse in a dilute, non-ionic surfactant or liquid detergent system, followed by a final rinse in de-ionized water to eliminate water spots due to hard salts and contaminant redeposition.

Compatibility

The 590-S is non-reactive with ceramics, glass and metals such as brass, copper, iron, and silicon. It is reactive with strong acids.

Handling and Storage

The 590-S is biodegradable and inert. It is a caustic material, so the use of gloves and eye goggles is recommended. Keep container tightly closed and store in a cool, dry, well-ventilated area or cabinet. Isolate from incompatibles such as strong acids.

Crystalbond™ 509-S and Wafer-Mount™ 562-S Strippers

These strippers are high-performance, environmentally-safe, chemical cleaning agents developed specifically for removing Crystalbond™ 509, Wafer-Mount™ 562, and other tenacious polymer coatings and inorganic particulates.

Features

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

Usage

These cleaning agents work best in ultrasonic systems at 50–60 °C. The evaporation rate is much slower than acetone, so a good lifecycle will be achieved in comparison. As adhesive residue begins to concentrate in the stripper, 20% of the stripper should be replaced with fresh material.

Rinsing

After removing the adhesive, a step-wise, warm-rinsing process is recommended. Rinse in a dilute, non-ionic surfactant or liquid detergent system, followed by a final rinse in de-ionized water to eliminate water spots due to hard salts and contaminant redeposition.

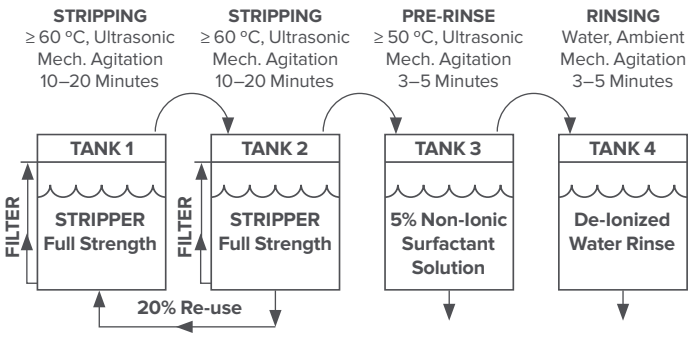
Compatibility

Strippers are non-ionic and non-reactive with metals, however, they will attack many types of polymers and plastics such as elastomers and rubbers. Contact Aremco with any questions about compatibility.

Handling and Storage

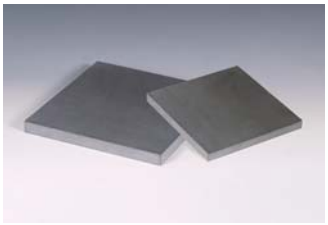
Crystalbond™ strippers are readily biodegradable and non-toxic to marine life. The use of gloves and eye goggles is recommended. Respiratory protection or ventilation is recommended under normal handling. When heated, vapors should be ventilated from work space. Keep container tightly closed and store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

Suggested Process Diagram For Cleaning



MACHINING ACCESSORIES

Ceramic Mounting Blocks



Aremcolox™ 502-1100 Alumino-Silicate, unfired machinable ceramic is an ideal mounting block for substrates. This ceramic provides a rigid mounting surface and is excellent for dressing the diamond wheel as thru-cuts are made. The ceramic's surface can be re-faced to keep operating costs to a minimum. Standard ground, flat and parallel plates are available, ½″ × 4″ × 4″ and ½″ × 6″ × 6″. Custom sizes are available upon request.

Diamond Wheels

Aremco offers a complete range of metal- and resin-bonded diamond wheels, custom mounting flanges and dressing sticks.

120-Series, Metal-Bonded

Sintered, impregnated wheels consisting of a uniform distribution of diamond in a metal matrix metallurgically bonded to the wheel periphery. Wheels to 20 mils thick.

OD	ID	Thickness
2″	⅝″	.004–.010″
2 3⁄16″	⅝″	.006–.012″
2¼″	⅝″	.006–.012″
2½″	⅝″	.006–.012″
2¾″	⅝″	.006–.012″
3″	⅝″	.006–.012″
3¾″	⅝″	.009–.015″
4″	⅝″	.010–.016″
5″	⅝″	.015–.020″

126-Series, Resin-Bonded

Phenolic-based wheels consisting of a diamond matrix distributed throughout the entire surface area of the wheel. The phenolic wears away, continuously exposing new diamond. Wheels to 20 mils thick.

OD	ID	Thickness
3″	1.575″	.003–.020″
4″	2.75″	.003–.020″
4½″	2.75″	.003–.020″

Cutting Lubricant

Aremco-Cool™ 558 is a translucent, water-soluble concentrate which provides exceptional lubricity and wetting of extremely abrasive materials. It improves machinability, reduces tool wear, and will not cause corrosion or buildup when diluted with clean water. Aremco-Cool™ is biodegradable, odorless and environmentally-safe to operators. A ratio of 32-parts water to 1-part concentrate is typically recommended.

Miniature Diamond Drills

Aremco's miniature diamond drills are used to produce chip-free, high-precision holes in fired ceramics and other ultra-dense materials. Miniature solid drills are offered from 6 to 40 mils in diameter. Miniature core drills are offered with inside diameters from 20 to 500 mils.

Series 107 Solid Diamond Drills

Part Number	Drill Dia.	Drill Pt. Length	Shank Length	Shank Dia.	Part Number	Drill Dia.	Drill Pt. Length	Shank Length	Shank Dia.
107-SD5	0.005″	0.020″	1 1⁄16″	0.040″	107-SD15	0.015″	0.060″	1 3⁄16″	0.040″
107-SD6	0.006″	0.024″	1 1⁄16″	0.040″	107-SD16	0.016″	0.064″	1 3⁄16″	0.040″
107-SD7	0.007″	0.028″	1 1⁄16″	0.040″	107-SD17	0.017″	0.068″	1 3⁄16″	0.040″
107-SD8	0.008″	0.032″	1 1⁄16″	0.040″	107-SD18	0.018″	0.072″	1 3⁄16″	0.040″
107-SD9	0.009″	0.036″	1 1⁄16″	0.040″	107-SD19	0.019″	0.076″	1 3⁄16″	0.040″
107-SD10	0.010″	0.040″	1 1⁄16″	0.040″	107-SD20	0.020″	0.080″	1 3⁄16″	0.040″
107-SD11	0.011″	0.044″	1 3⁄16″	0.040″	107-SD25	0.025″	0.100″	1½″	0.125″
107-SD12	0.012″	0.048″	1 3⁄16″	0.040″	107-SD30	0.030″	0.100″	1½″	0.125″
107-SD13	0.013″	0.052″	1 3⁄16″	0.040″	107-SD35	0.035″	0.100″	1½″	0.125″
107-SD14	0.014″	0.056″	1 3⁄16″	0.040″	107-SD40	0.040″	0.100″	1½″	0.125″

Series 109 Diamond Core Drills

Part Number	Core ID	Core OD	Core Length	Total Length	Part Number	Core ID	Core OD	Core Length	Total Length
109-37	0.020″	0.046″	⅛″	1.00″	109-112	0.112″	0.152″	¼″	1.50″
109-38	0.025″	0.050″	⅛″	1.00″	109-116	0.116″	0.156″	¼″	1.50″
109-39	0.025″	0.055″	⅛″	1.00″	109-120	0.120″	0.160″	¼″	1.50″
109-40	0.040″	0.060″	⅛″	1.00″	109-128	0.128″	0.168″	¼″	1.50″
109-41	0.041″	0.061″	⅛″	1.00″	109-136	0.136″	0.176″	¼″	2.00″
109-42	0.042″	0.062″	⅛″	1.00″	109-140	0.140″	0.180″	¼″	2.00″
109-43	0.043″	0.063″	⅛″	1.00″	109-144	0.144″	0.184″	¼″	2.00″
109-48	0.048″	0.068″	⅛″	1.00″	109-147	0.147″	0.187″	¼″	2.00″
109-52	0.052″	0.072″	⅛″	1.00″	109-149	0.149″	0.189″	¼″	2.00″
109-55	0.055″	0.075″	⅛″	1.00″	109-152	0.152″	0.192″	¼″	2.00″
109-59	0.059″	0.079″	⅛″	1.00″	109-154	0.154″	0.194″	¼″	2.00″
109-63	0.063″	0.083″	⅛″	1.00″	109-157	0.157″	0.197″	¼″	2.00″
109-67	0.067″	0.087″	⅛″	1.00″	109-159	0.159″	0.199″	¼″	2.00″
109-70	0.070″	0.090″	⅛″	1.00″	109-161	0.161″	0.201″	¼″	2.00″
109-73	0.073″	0.093″	⅛″	1.00″	109-166	0.166″	0.206″	¼″	2.00″
109-76	0.076″	0.096″	⅛″	1.00″	109-169	0.169″	0.209″	¼″	2.00″
109-78	0.078″	0.098″	⅛″	1.00″	109-173	0.173″	0.213″	¼″	2.00″
109-81	0.081″	0.101″	⅛″	1.00″	109-177	0.177″	0.217″	¼″	2.00″
109-82	0.082″	0.102″	⅛″	1.00″	109-180	0.180″	0.220″	¼″	2.00″
109-86	0.086″	0.106″	⅛″	1.00″	109-182	0.182″	0.222″	¼″	2.00″
109-89	0.089″	0.109″	⅛″	1.00″	109-185	0.185″	0.225″	¼″	2.00″
109-93	0.093″	0.113″	⅛″	1.00″	109-188	0.188″	0.228″	¼″	2.00″
109-96	0.096″	0.136″	¼″	1.50″	109-203	0.203″	0.243″	¼″	2.00″
109-98	0.098″	0.138″	¼″	1.50″	109-218	0.218″	0.258″	¼″	2.00″
109-99	0.099″	0.139″	¼″	1.50″	109-234	0.234″	0.274″	¼″	2.00″
109-101	0.101″	0.141″	¼″	1.50″	109-250	0.250″	0.290″	¼″	2.00″
109-104	0.104″	0.144″	¼″	1.50″	109-312	0.312″	0.372″	¼″	2.00″
109-106	0.106″	0.146″	¼″	1.50″	109-375	0.375″	0.435″	¼″	2.00″
109-110	0.110″	0.150″	¼″	1.50″	109-437	0.437″	0.497″	¼″	2.00″
109-111	0.111″	0.151″	¼″	1.50″	109-500	0.500″	0.560″	¼″	2.00″

Refer to Price List for complete order information.