# PROCEDURE FOR SEALING CERAMIC ADHESIVES AND POTTING MATERIALS

Technical Note

Producing a high temperature, gas-tight, moisture-proof, or hermetic seal using a ceramic adhesive or potting compound is a common, but difficult to achieve objective given the inherent porosity of these types of materials. However, some suggestions for sealing ceramic adhesives and potting compounds are offered in this Technical Note.

## Step #1: Select the Appropriate Sealer

For **Gas-Tight Seals**, we suggest sealing using either (a) a product thinner, or (b) a glass sealer.

Aremco's product thinners are identified by adding a "-T" to the part number (ex. Ceramabond 503-T). Note that these are not traditional chemical thinners. Instead, the thinner is the binder system used in the designated adhesive. As such, the thinner has both adhesive and sealant properties, and will help to seal porosity upon curing.

Aremco's glass sealers include Aremco-Seal 613 and 617. These sealers will flow upon curing, and are best for achieving a gas-tight or hermetic seal. Refer to Aremco Tech Bulletin A5-S4 for additional details.

For **Moisture Protection**, Aremco offers a wide selection of high temperature silicone coatings that are suitable for applications to 1100 °F (590 °C). Refer to Aremco Tech Bulletin A6-S3 for additional details.

## Step #2: Apply the Ceramic Adhesive or Potting Compound

For **ceramic adhesives**, apply the adhesive to both parts and then assemble and clamp if possible.

For **ceramic potting compounds**, pour the mixture slowly into the part, ensuring the material flows into all gaps and voids, without creating air pockets.

## Step #3: Cure the Ceramic Adhesive or Potting Compound

Follow the general cure schedule recommended in the Tech Bulletin, but final cure at a minimum of 700 °F (370 °C), and as high as 1000 °F (540 °C), to stabilize the material completely for sealing.

## Step #4: Apply the Sealer

Apply a layer of the thinner, glass sealer or silicone coating using a small foam brush, making sure that it penetrates any observable porosity.

## Step #5: Cure the Sealer

Materials with a "-T" designation should be cured following the guidelines of the corresponding base product. For example, 503-T should be cured according to the cure schedule provided for 503.

Aremco-Seal 613 and 617 must be heated to their softening or flow point to create an effective seal. The softening/flow temperature for 613 is 1150–1250 °F, while for 617 it is 1830 °F. Be sure to select a glass whose flow temperature is higher than the component's maximum use temperature.

Aremco's silicone coatings are typically cured at 450–500 °F (230 °C–260 °C) in 45–60 minutes.

## Additional Guidelines When Bonding with a Ceramic Adhesive

The following criteria must be observed to achieve the best sealing results with Aremco's ceramic adhesives.

1. The materials to be bonded and sealed should have similar coefficients of thermal expansion (CTE).
2. The clearance between mating parts should be 0.002″ to 0.008″ (50–200 microns).
3. The length of the "glue line" (seal area length) must be as long as possible.
4. Butt joints are not recommended. Lap, "U" or "L" joints are better designs.
5. Surfaces to be bonded should be clean and free of oils and grease.
6. Surfaces should be sandblasted wherever possible.