



APTEK LABORATORIES, INC.

ISO 9001 / AS9100 Certified

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TECHNICAL DATA & INFORMATION

APTEK® 2712-A/B

- Very low stress Silicone Adhesive
- -110°C to 260°C operating range
- Low outgassing/space grade

PRODUCT DESCRIPTION

APTEK 2712-A/B is a two component, white, very soft, thixotropic, electrically insulative, silicone adhesive displaying excellent flow temperature flexibility and unusually high physical strength properties.

APTEK 2712-A/B has been designed to fully cure at room temperature and can be accelerated with a brief low temperature cure. This 100% solids system has been manufactured with highly pure resins to minimize the occurrence of ionic contamination without outgassing during cure or service.

KEY FEATURES AND BENEFITS

- Very flexible/low modulus over wide temperature range to absorb stress build-up during thermal cycling
- Convenient 1/1 PBW or PBV mix ratio for easy handling-ideal for cartridge dispensers/repair kits
- Very good adhesion to various substrates when used in conjunction with MOMENTIVE SS4155 primer or Dow Corning's 1200 primer.

HANDLING INFORMATION

Mix ratio, PBW or PBV 100 (2712-A)/100 (2712-B)

Work Life, @ 25°C, 10 gm mass, minutes 30

Handling Notes

- Silicone resins and primers are moisture sensitive, therefore, blanket containers of any unused portions with Argon or dry nitrogen prior to resealing.
- Prior to application of adhesive, clean part(s) to be bonded with a lint free cloth and MEK or other suitable degreaser. Then wipe with isopropyl alcohol and allow to dry.
- Priming Procedure:
 - Apply primer to clean, dry surface by brushing, wiping with a lint free cloth, or dipping. Spraying may sometimes produce erratic results and is not recommended.

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- Only apply a very thin coat of primer approximately 0.015mm (0.5mil). Excess primer will actually reduce adhesion.
- Allow primer to dry for 90 minutes to 2 hours at 25°C and 45-75% RH prior to application of fresh adhesive mixture. Longer drying times may be required when RH is below 40%.
 - NOTE: We have found that mixing fresh MOMENTIVE SS4155 primer with anhydrous isopropyl alcohol at 1/1 PBW or PBV has demonstrated improved adhesion.
- Primer may be left to dry for up to 12 hours before application of the sealant without loss of bonding effects. However, the primed surface must be covered to prevent dirt or contaminant pick-up.

COMPATIBILITY:

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of silicone encapsulants and adhesives. Most notable of these include:

- Organotin and other organometallic compounds
- Silicone rubber containing organotin catalyst
- Sulfur, polysulfides, polysulfones or other sulfur-containing materials
- Amines, urethanes or amine-containing materials
- Unsaturated hydrocarbon plasticizers
- Some solder flux residues
- Latex rubber gloves

MIXING

Bulk handling

Weigh 100 parts of 2712 Part A into a clean, dry, glass, or metal, container and then add 100 parts of 2712 Part B. DO NOT MACHINE MIX-hand stir with glass or metal stirrer until complete and thorough blending is achieved, care should be taken to avoid any source of moisture contamination or air entrapment during mix.

Note: For best results and void-free bond line, vacuum mixture @ less than 10 mm Hg for 5 minutes minimum.

- **Dual cartridge/dispenser kits**
- Remove cartridge from Mil Spec bag and set aside.
- If not previously assembled, lift up the gray lever on top of gun and insert black plunger into dispenser gun by pushing up the silver lever in the back of the gun and inserting plunger into the slot through the front of the gun leading with the rounded handle. Pull the plunger all the way into the gun until the circular ports stop at the front of the gun.
- Lift up the gray lever on the top of the dispensing gun and insert/seat the cartridge into the dispensing gun with notch at the bottom end of cartridge barrel facing down.
- Lower the gray lever on the top of the dispensing gun to secure the cartridge in place. If the lever does not lower properly, the cartridge may be upside down.
- Twist off protective cap counterclockwise 90° until notch is in open position and remove cap exposing the adhesive ports.
- Inspect for material at both ends of the adhesive ports. If material is visible and flush at the ends of the ports, proceed with next step. If material is not flush at the ends of ports, squeeze the gun handle until a tiny bit of material comes out of both ports. Then wipe off the ports with a lint-free cloth so that material is flush at port-ends and no material is outside of the ports.
- Properly insert the notched base of mixing tip over the exposed adhesive ports and rotate the base of the mixing tip clockwise until it is secure.
- Pull the trigger of the gun until material is dispensed from the mix tip of the cartridge.
- Allow 3 inches of adhesive to extrude as waste before applying to bonding surface.

- Cut back tip of mixing tube to adjust bead size, as needed.
- Use material as needed.
- If material is remaining, remove used mix tip and discard and replace protective cap onto cartridge.
- To remove cartridge, push up silver lever and pull back black plunger fully; then lift up gray lever on top of the gun and remove cartridge.

CURE SCHEDULE

5-7 days @ RT
or
1 hour @ 65°C
or
30 mins @ 100°C
or
15 mins. @ 150°C

NOTES:

1. Above cure schedules are guidelines and user should determine proper cure depending on achievement of the application requirements.
2. For RT cure only:
 - Some surface tackiness may be evident up to 48 hours. However, adhesive will be firmly gelled.
 - Adhesive will continue to develop full strength in 5-7 days.
3. For RT setup followed by heat post cure:
 - User to determine how long at RT is required to achieve sufficient strength needed for specific application prior to heat post cure. It is recommended that the full heat cure is used as indicated above.

TYPICAL PROPERTIES

(values not to be used for specification purposes)

<u>CHARACTERISTICS</u>	<u>2712-A</u>	<u>2712-B</u>	<u>TEST METHOD</u>
Color	White	Translucent	Visual
Specific Gravity	1.15	1.15	ASTM D-1475
Viscosity @ 25°C	smooth, thixotropic paste	smooth, thixotropic paste	Visual
Flash point, °C	>150°C	>150°C	ASTM D-92
Shelf life @ 5°C or below in factory			
Sealed containers, months	6	6	

CURED PHYSICAL PROPERTIES *

* (Cured 1 hr @ 65°C or 5-7 days @25°C)

	<u>2712-A/B</u>	<u>TEST METHOD</u>
Hardness, Durometer A	32	ASTM-D-2240
Tensile Strength @ 25°C 0.058" thickness, psi	575	ASTM-D-638
Elongation, %	550	ASTM-D-638
Tear, Die C, pli	135	ASTM-D-624
Lap Shear Strength, 5 mil bondline thickness on primed aluminum panels, psi	475	ASTM-D-1002

Outgassing @ 10 ⁻⁶ torr		
TML, %	0.55	ASTM E-595
CVCM, %	0.05	ASTM E-595
Glass transition Temp (T _g), °C	-110	ASTM E-831
Coefficient of thermal expansion, in/in/°C		
alpha 1	54 x 10 ⁻⁶	ASTM E-831
alpha 2	235 x 10 ⁻⁶	ASTM E-831
<u>CURED ELECTRICAL PROPERTIES</u>	<u>2712-A/B</u>	<u>TEST METHOD</u>
Volume resistivity, ohm-cm	1 x 10 ¹⁵	ASTM D-257
Dielectric strength, volts/mil, 0.250" thick	350	ASTM D-149

SAFETY AND FIRST AID

APTEK 2712-A is a silica-filled silicone resin blend that is safe to handle when used properly. It is judged to be low in toxicity and to be rated as a slight skin irritant. Avoid contact with skin and eyes and use in a well-ventilated area and avoid breathing vapors. In case of eye contact, flush with fresh clean water for at least 15 minutes; for skin contact, wash thoroughly with soap and water. If swallowed, drink at least one pint of water and call a physician. Refer to Material Safety Data Sheet for more details.

APTEK 2712-B is a silica-filled silicone resin blend, which is safe to handle when used properly. Avoid skin and eye contact and use in a well-ventilated, hooded area. In case of eye contact, flush profusely with fresh clean water and contact a physician. For skin contact, wash thoroughly with soap and water. If inhaled, move subject to fresh air and provide water to drink. If swallowed, dilute with at least one pint of water and contact physician immediately. Refer to Material Safety Data Sheet for more details.

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