



18781 County Road 22
Glenwood, MN 56334
800-443-2136; 952-224-4425
www.Tanisaircraft.com

INSTRUCTION No: 186
Rev. A JAN-10-2012 GDO
Approval: Bob Krueger

TANIS PAD HEAT ELEMENT BONDING INSTRUCTION

Preparation:

Thoroughly review these procedures BEFORE starting any Pad Heat Element installation.



DO NOT CONNECT ELEMENTS TO POWER UNTIL PROPERLY INSTALLED.

Material list. (Material Descriptions page 3).

Supplied:

- Pad Heat Element(s) for installation.
- CB911, Click Bond™ Solvent Wipe(s).
- AC-1230, Tanis bonding sealant.
(Alternate bonding sealant: Dow Corning DC 730 sourced separately.)



DO NOT USE ANY OTHER BONDING AGENTS, SILICONE, OR RTV.

What you need:

- Clear access to engine(s) and/or accessories in equilibrium with a standard room temperature of 18°C (65°F) to 27°C (80°F).
- Industrial solvent.
- Securing Material/Fixture, for element placement during cure.
- Clean lint free rags or cloth conforming to AMS 3819.
- Optional Primer: Dow Corning DC 1200 Prime Coat, adhesion promoter. Not required when using the CB911 Solvent Wipe, though suggested in rough service application.

Element Location:

The installation site is to be smooth, and clear of obstructions. Pre-fitting trial installation without sealant is suggested for all installations. This should include the fitting of fixtures for first time and complex installations. A simple installation may only require tape or equivalent. Consider lead orientation, system installation instruction, and cable routing.

Tape or custom formed fixture(s) must be capable of maintaining pressure on the pad element throughout the cure process. The mounting site and the area immediately adjacent to the pad element perimeter must be clean in order to allow for proper sealant and tape adhesion, and/or fixture attachment.

Surface Preparation:

Thoroughly clean and degrease the installation site. A progressive cleaning procedure should be employed using appropriate solvents and a new lint-free cloth conforming to AMS 3819. Contaminants such as dirt, grease, and/or processing lubricants, must be removed prior to sealant application. Always pour solvent on the cloth to avoid contaminating the solvent supply. Wash one small area at a time.

When oil based solvents such as Stoddard's Solvent are used, it is imperative that all oil residues are removed and surfaces are dried with a second clean cloth prior to the solvent evaporating to prevent re-depositing contaminants on the substrate.

Before applying sealant to substrates (bonding surfaces, element and part or assembly of intending mounting) **aggressively** wipe down the installation surfaces with the Click Bond™ CB911 Solvent Wipe and let dry for 5 minutes (Optional Dow Corning, DC 1200 Prime Coat can be applied after Solvent Wipe). Substrate composition can vary greatly. This can affect sealant adhesion. It is recommended that adhesion characteristics to a specific substrate be determined prior to application on parts or assemblies.

For more information on proper surface preparation, consult Society of Automotive Engineers (SAE) Aerospace Information Report, (AIR) 4069 available through SAE, 400 Commonwealth Avenue, Warrendale, PA 15096-001.

Element Installation:

1. "Surface Preparation" must be completed prior to element installation.
Note: If using tape to secure pad during curing process, size as needed before proceeding to step 2. Keep in mind that tape will extend beyond the perimeter of the pad in order to allow for adequate contact with the part or assembly to hold the element in place during the sealant cure process.
2. Prep the contact surface of the pad element (flat unmarked side) with CB911 solvent wipe.
3. Apply bonding sealant, AC-1230 or DC 730 to the cleaned contact surface of the pad (Figure 1).
4. **DO NOT USE ANY OTHER BONDING AGENT!**
Evenly spread the sealant into a thin layer. *Only a very thin layer is required, less than the thickness of fine safety wire of .020 inch, Fig. 2.*



Figure 1



Figure 2

- ⚠ The Pad Heat Element must be in complete bonded contact with the mounting surface through the bonding sealant. Voids in the installation site directly under the element must be filled with bonding sealant in order to provide proper thermal transfer.**

5. Place the pad (sealant down) in desired installation location.
6. Starting from the center of the pad use a roller or plastic putty applicator and gently draw it across the surface to the outer edge of the element. This process will fill imperfections in the mounting surface, expel air bubbles, and remove excess bonding agent from under the element. When the proper amount of sealant is used, very little will extrude out from under the pad.
7. Clean up excess sealant, sealing the edge of the element in the process.
8. Secure the element for sealant cure using tape and/or pre-fitted field manufactured pressure fixture, such as a fitted pressure block, cable ties, bungee cords, or safety wire.
9. Once the bonding agent has cured (see process below) remove tape and/or fixtures and apply a dollop of the bonding sealant under the base of the element lead (where lead enters element). This reduces wire fatigue and guards against the incursion of fluids at this location.
10. If you have not already done so, seal the perimeter of the element with bonding sealant. Use just enough of the sealant to create a smooth transition along the edge of the element to mounting surface. This transition is not to extend beyond one quarter of an inch from the element.

- ⚠ Do not coat the top surface of the pad element with bonding sealant.**

Cure Process:

- Tanis recommends a minimum undisturbed full cure time of 8 hours in standard conditions of 21°C/70°F with humidity level of 50% before the removal of tape, installation blocks, or other securing devices.
- However, a minimum undisturbed initial cure time of 2 hours in standard conditions is possible before removing tape or other devices for securing the element during sealant cure. If the short initial cure is used, removal of securing materials must be done in a manner that avoids disturbing the pad.
- Cure time is dependent on a number of variables such as thickness of the bonding agent, temperature, and humidity levels. Due to the many variables involved, the sealant may be far enough along in the cure process within two hours for a return to service, with the completion of the final cure process under engine operating temperatures. The processing temperature (cure temp.) for AC-1230 and DC 730 is between 0°C/32°F and 80°C/175°F. The operating temperature of the aircraft engine can complete the cure of the bonding sealant as long as the above value (80°C/175°F) is not exceeded.

- **Do not attempt** to cure the bonding agent by applying power to the preheat system.
- **Do not touch** any of the elements while the system is in operation as elements may burn exposed skin.

It is the responsibility of the maintenance facility or releasing authority to ensure that the bonded element(s) and all components are properly secure conforming to AC43:13-1b., and company standards before returning the aircraft to service.

Maintenance:

At each 100-hour or annual equivalent inspect elements and cabling. If any portion of a pad heat element becomes loose, it may be re-bonded.

- ⚠ **The heat element mating surface must be in complete bonded contact through the bonding sealant.** Any element(s) that develops a yellowing/gray colored area requires replacement. For more information, refer to Tanis ICA, and Service Bulletins (www.tanisaircraft.com).

Materials Description:

- Tanis Pad Heat Elements, and their associated components have no expiration date when properly stored in standard room conditions at/or below 80°F/27°C.
- CB911 Click Bond™ Solvent Wipe, surface-prep, and primer.
This solvent wipe contains a powerful cleaning solution and will etch plastic or painted finishes.
- AC-1230 bonding sealant conforming to MIL-A-46106, clear without dyes.
- DC 730 high temperature, solvent resistant fluorosilicone adhesive/sealant, conforming to Mil-A- 46146.
Note: AC-1230 and DC 730 release acetic acid during the cure process.
- ⚠ **DO NOT USE ANY OTHER BONDING AGENTS. This includes other silicones or RTV's, red, blue or white. Other silicones are not approved.** AC-1230 and DC 730, bonding sealants offer good compression set resistance under harsh fluid exposure and extreme temperatures, provides superior adhesion and heat transfer qualities on a variety of surfaces. Determine adhesion characteristics on a specific substrate prior to application on parts or assemblies. **Check expiration date of bonding sealant before starting installation.** Storage life of AC-1230 is 6 months when stored at temperatures below 80°F/27°C and up to one year if refrigerated at temperatures below 40°F/4°C. Storage life of DC 730 has a usable life of 18 months when stored at or below 90°F/32°C.
- Industrial Solvents, naphtha, mineral spirits, xylene, toluene, Stoddard's, butyrate thinner and MEK. Refer to manufacturer specification sheets and company manuals for product information and precautions.
- Securing Materials/Fixtures: A means of holding the heat element firmly in place during cure is required. Pressure blocks made of dense construction polystyrene foam can be shaped and held in place by various means. In many installations, the use of a flexible porous tape (such as Kendall Curity Standard Porous Tape®) that allows for exposure to humidity and off gassing during cure of the bonding sealant is adequate.
- Clean lint free rags or cloth, conforming to Aerospace Standard AMS 3819 specifications.
- Optional Primer: Dow Corning DC 1200 Prime Coat is an adhesion promoter that enhances the coupling characteristics of AC-1230 and DC 730.
Note: This primer is not required when using the Tanis supplied CB911 solvent wipe. It is however recommended in rough service installations.

---END---