



INSTRUCTION - BONDING
TN02788
Pad Element Installation

RECORD OF REVISIONS

When updated, this document is changed in its entirety.

Rev	Date	Description	By	Approval
H	OCT-14-2014	Add * Note for edge sealant in Section 5. (I).	DNE	
G	SEP-25-2014	Section 2.1, Old DC 732 part number AC-1230.	DNE	DNE
F	SEP-24-2014	Add P/S 700 and procedure.	DNE	DNE

CONTENTS

RECORD OF REVISIONS 1

CONTENTS 1

1. PURPOSE 2

2. REQUIREMENTS..... 2

 2.1 Materials 2

 2.2 Tools 2

3. DESCRIPTION 2

4. SURFACE PREPARATION 3

5. ELEMENT INSTALLATION 3

 5.1 Sealant Cure 4

6. ELEMENT REMOVAL 4

PROPRIETARY DATA

Tanis Aircraft Products proprietary rights are included in the information disclosed herein. The recipient by accepting this document agrees that neither this document nor the information disclosed herein nor any part thereof shall be reproduced or transferred to other documents or used or disclosed to others for manufacturing or for any other purpose except as specifically authorized in writing by Tanis Aircraft Products.

1. PURPOSE

The purpose of this instruction is to aid in the installation of Tanis Pad Heat Element.

2. REQUIREMENTS



Caution: Do not connect elements to power until properly installed. Sealant cure process varies and can take in excess of 8 hours. Review Section 5.1 below.

Work is to be performed in a clean environment under standard temperature conditions:

18°C / 65°F to 27°C / 80°F.

2.1 Materials



Caution: Use only approved sealants listed below. Check expiration date before using.

- (a) Tanis Pad Heat Element.
- (b) CB911, Click Bond™ Solvent Wipe.
- (c) TU02788 (old P/N: AC-1230) bonding sealant, repackaged Dow Corning DC 732.
- (d) Cloth/rags, lint-free, conforming to AMS 3819.
- (e) Optional bonding sealant: Dow Corning DC 732, clear silicone bonding sealant.
- (f) Optional bonding sealant: Dow Corning DC 730, white high temperature fluorosilicone.
- (g) Optional perimeter sealant: PPG Aerospace P/S 700.
- (h) Optional primer: Dow Corning DC 1200. Suggested in rough service application.
Not required when using the CB911 solvent wipe.

2.2 Tools

- (a) Ohmmeter certified to traceable standard.
- (b) Plastic putty applicator (scraper or spatula), or equivalent, optional roller.
- (c) Pad Securing options:
 - Tape: Flexible porous tape (Kendall Curity Standard Porous Tape®). Porous tape allows for exposure to humidity and off gassing during cure.
 - Pressure blocks made of dense construction polystyrene foam shaped and held in place by various means; cable ties, bungee cords, or safety wire.
 - Vacuum Bagging. Process uses plastic sheet and vacuum pump to apply uniform pressure to the pad during sealant cure. Best results may be achieved on complex installations using this method.

3. DESCRIPTION

Installation site is to be smooth and clear of obstructions. Pre-fitting, trial installation without sealant is suggested for all installations. Consider lead orientation, system installation instruction, and cable routing. Simple installation may only require tape or equivalent. Complex installation may require vacuum bagging or alternate fixtures. Tape or custom formed fixture(s) must be capable of maintaining pressure on the pad element throughout the cure process. Mounting site and area immediately adjacent to pad element perimeter must be clean in order to allow for proper sealant and tape adhesion, and/or fixture attachment.

4. SURFACE PREPARATION

Cleaning of installation site is to be accomplished prior to installation in accordance with (IAW) AC43.13-1B, industry standards, acceptable methods, techniques and practices, Airframe/Engine Manufacturer's recommendations, and approved procedures set in place by the installing authority. In addition, the following procedures may be applied.

- (a) Use progressive cleaning procedure with appropriate solvents and new lint-free cloth conforming to AMS 3819.
- (b) Contaminants such as dirt, grease, and/or processing lubricants must be removed prior to adhesive/sealant application. Always pour solvent on the cloth to avoid contaminating solvent supply. Wash one small area at a time. Clean substrate with solvent, using rolling motion to remove surface contamination. Inspect cloth and repeat if contamination on wiping cloth is visible. Repeat using clean solvent wipe until solvent wiping cloth remains clean upon inspection.
- (c) Immediately after solvent wipe use second clean dry cloth and wipe substrate using rolling motion to remove residual solvent prior to the solvent evaporating. This is done to prevent the re-depositing of contaminants on substrate. **DO NOT ALLOW SOLVENT TO FLASH-OFF.**
- (d) 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.

5. ELEMENT INSTALLATION

Surface Preparation must be completed prior to element installation. Substrate composition varies, and will affect sealant adhesion. Verify adhesion characteristics on specific substrate prior to final installation.

- (a) Assemble securing materials (tape, fixtures, and/or vacuum system).
- (b) Measure element for proper values. Compare values listed in preheat kit installation instructions, or calculate using the part number: Digits after dash (-) callout voltage, numbers after slash (/) callout wattage. $\text{Voltage squared, divided by Wattage} = \text{Resistance}$ ($V^2/W=R$). Resistance values are to be +/- 10%.
- (c) **Aggressively** wipe down installation site and bonding side of element with CB911 Solvent Wipe followed immediately by dry wipe. (Optional Dow Corning, DC 1200 Prime Coat can be applied after using the Click Bond Solvent Wipe).
- (d) Apply bonding sealant to the cleaned contact surface of the pad.
- (e) Evenly spread the sealant into a thin layer. Only a very thin layer is required, about the thickness of safety wire, between 0.020-0.032 on an inch.
- (f) **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.**
- (g) Place pad element (sealant down) in desired installation location.
- (h) Starting from the center of the pad element, use a roller or plastic putty applicator and gently draw across surface to outer edge of element. This process will fill imperfections in mounting surface, expel air bubbles, and remove excess bonding sealant from under

element. When proper amount of sealant is used very little will extrude out from under pad element.

- (i) Thoroughly clean excess sealant from perimeter and top surface of pad element.
- (j) Secure element for cure using vacuum bagging system, tape, and/or pre-fitted field pressure fixture, such as a foam pressure block secured with cable ties, bungee cords, safety wire, or other means.
- (k) Once bonding agent has cured (Reference Section 5.1), remove tape, fixtures, and/or vacuum bagging devices.
- (l) Seal edge of element with bonding sealant, or optional edge sealant P/S 700*. Use only enough sealant to create smooth transition along edge of element to mounting surface. Perimeter edge sealant transition is not to extend beyond 3/8 of an inch (0.375") from the element, and not more than 3/16 of an inch (0.188") onto the element's upper surface.
- (m) Note: When using optional edge sealant P/S 700, substrate adjacent to element and perimeter surface of pad must be free of bonding sealant for proper adhesion.
- (n) Apply a dollop of sealant under the base of the element lead (where lead enters element). This reduces wire fatigue and helps to guard against fluid incursion.

5.1 Sealant Cure



Caution: Do not attempt to cure sealants by applying power to the element.

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, or other securing devices.

Before returning the aircraft to service, it is the responsibility of technician and/or maintenance/repair facility performing the installation to ensure that the bonded element(s) are properly secure.

Cure time is dependent on a number of variables, element size, sealant thickness, temperature, and humidity levels. Under standard conditions, it is possible to return to service with a minimum initial cure time of 2 hours with completion of final cure process under engine operating temperatures.

When minimum cure is used, removal of securing materials must be done in a manner that avoids disturbing element and sealant.

The processing temperature (cure temp.) for DC 732 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 as long as 80°C / 175°F is not exceeded.

Optional P/S 700 edge sealant requires full cure per manufacturer's specifications.

6. ELEMENT REMOVAL

To remove element, select an appropriate tool/scrapper that will not damage substrate. Use tool to lift and release a corner of element, gripping released area, slowly and firmly pull out and away from mounting surface. As required, use tool to separate element from substrate. Use of a solvent in combination with scrapper may ease removal. After pad is removed, clean all bonding sealant from the installation site without damaging surfaces or finishes.

***** NOTHING FOLLOWS *****