

FUEL TANK SEALING - MAINTENANCE PRACTICES

1. General

- A. If a leak has started in the tank or the wing has been repaired, you may need to seal the fuel tank again. These procedures provide instructions to classify leaks, repair leaks, seal the fuel tank during structural repair, and to do an integral fuel tank test.
- B. The sealant must be applied properly to make sure the fuel tank seals completely. Refer to Chapter 20, Fuel, Weather and High-Temperature Sealing - Maintenance Practices for specific sealing procedures and illustrations.

2. Integral Fuel Bay Sealant

- A. Two kinds of sealants are used, one to seal the bay and the other to seal the access doors, the fuel quantity transmitters, the fuel inlet assemblies, and the fuel test receptacle. The access door sealant is more pliable and will not bond to metal as firmly as the bay sealant. The access door sealant lets the doors, the fuel quantity transmitters, etc., be removed without damage. The sealants can be identified by color. The bay sealant is white and its accelerator is a black paste. The access door sealant is red or black and its accelerator is black.

3. Mixing and Applying Sealant

WARNING: Do cleaning and sealing operations in a well ventilated area away from excessive heat, open flame and sparks. Do not smoke in any area where cleaning solvents and sealants are being used.

WARNING: Use cleaning solvents only from approved containers.

WARNING: Discard solvent-wetted cheesecloth and used solvent in specially supplied safety containers. Put reusable, solvent-saturated cleaning cloths in designated containers.

WARNING: Wear rubber gloves and safety glasses or goggles during cleaning operations. When you use solvent and sealing materials, prevent contact with eyes or breaks in skin, and repeated or prolonged contact with skin.

WARNING: Do not ingest solvent and sealing materials. Before eating or smoking, thoroughly wash your hands after you use solvent and sealing materials.

- A. Refer to specific manufacturer's instructions and Chapter 20, Fuel Weather and High-Temperature Sealing - Maintenance Practices for procedures to mix and apply all types of sealants.

4. Cure Time

- A. Cure time for sealants is calculated at a temperature of 77°F and 50 percent relative humidity. Table 201 contains the cure time for Type I and Type VIII sealants:

Table 201. Cure Properties of Type I and Type VIII Sealants

CLASS	MINIMUM APPLICATION TIME (HOURS)	MAXIMUM TACK-FREE TIME (HOURS)	MAXIMUM CURE TIME (HOURS)
TYPE I			
A-1/2	0.5	10	40
A-2	2.0	40	72
B-1/2	0.5	4	6
B-2	2.0	40	72
TYPE VIII			
B-1/2	0.5	10	24
B-2	2.0	24	72

5. Fuel Leak Classes

- A. Classes of Fuel Leaks (Refer to Figure 201).

NOTE: The class of a leak is identified by the size of the monitored leak. The leak location will identify if repair is necessary before the next flight.

- (1) Stains - An area of 0.75 inch in diameter (or less) is classified as a stain.
- (2) Seep - An area from 0.75 inch to 1.50 inches in diameter is classified as a seep.

- (3) Heavy Seep - An area from 1.50 inches to 4.00 inches in diameter is classified as a heavy seep.
- (4) Running Leak - The size will be different with location and intensity of the leak.

B. Leaks that must be repaired before flight are:

- (1) Running leaks in any area.
- (2) Stains, seeps or heavy seeps in a closed area.

NOTE: "Closed areas" means an area inside a wing leading edge or the section of a fuel tank located between the rear spar and the trailing edge.

C. Repair the following leaks when the airplane is grounded for other maintenance:

- (1) Stains, seeps or heavy seeps not in a closed area.

6. Sealing Fuel Leaks

A. Find Source of Leak.

- (1) Fuel can flow along a seam or structure of the wing for several inches. This makes it hard to find the leak source. A stained area is an indication of the leak source.
- (2) To find fuel leaks do a Integral Fuel Bay Test of the complete bay.
- (3) Another procedure to find the source of a fuel leak is as follows:
 - (a) Remove the access doors in the area of the leak.
 - (b) Apply a soap bubble solution to the outside of the bay in the area of the leak.
 - (c) Use a nozzle to blow air from the inside of the bay in the area of the leak.
 - (d) Monitor the outside of the bay for air bubbles.

B. Repair Leak.

NOTE: To see an illustration of the different sealing procedures given below, refer to Chapter 20, Fuel, Weather, Pressure and High-Temperature Sealing - Maintenance Practices.

- (1) Remove the sealant in the area of the leak.
- (2) Clean the area and apply a fillet seal. Use a small paddle to push the sealant into the area of the leak. Make sure to remove all the air bubbles from the seal.
- (3) If the leak occurs around a rivet, the rivet must be driven again.
- (4) If the leak occurs around a bolt, loosen the bolt, torque the bolt, and seal around the nutplate.
- (5) If removed, apply fay surface door sealant to the access doors, the fuel quantity transmitters, etc.
- (6) If removed, install the access doors, the fuel quantity transmitters, etc.
- (7) Do a fuel leak test on the fuel bay (Refer to Integral Fuel Bay Test).

7. Wing Sealing During Structural Repair

A. Preliminary Notes.

NOTE: To see an illustration of the different sealing procedures given below, refer to Chapter 20, Fuel, Weather, Pressure and High-Temperature Sealing - Maintenance Practices.

- (1) Seal that bay area after any repair that breaks the fuel bay seal. If it is necessary to seal the repair parts, make sure they are installed during the sealing procedures.
- (2) Make sure to fay-surface-seal and fillet seal the fuel side of all the joints within the boundary of the bay which do not supply a direct fuel path out of the bay. The fuel spar flanges and the rib flanges are examples of these joints.
- (3) To fay-surface-seal is to apply sealant to one mating part before the parts are assembled. When you make a fay-surface-sea, make sure to apply enough sealant so it will squeeze out completely around the joint when the parts are attached.
- (4) Apply a fillet seal after the joint is fay-surface-sealed and attached. Apply a fillet seal to the edge of all riveted joints, joggles, bend reliefs, voids, rivets, or fasteners. Seal all boundaries and any other place that could become a fuel leak.
- (5) It is not necessary for the fay sealant to cure before you apply the fillet seal. However, the fay sealant must not have dirt or other contaminants before you apply the fillet seal.
- (6) Join the fillets laid on intersecting joints to make a continuous seal. Make sure to push the sealant into the joint to

remove trapped air bubbles.

- (7) Use an extrusion gun to lay a bead along the joint. Use a small paddle and remove all the trapped air to eliminate the bubbles.

B. Sealing Procedures.

CAUTION: Protect drain holes and fuel outlet screens when you apply sealants.

NOTE: To see an illustration of the different sealing procedures given below, refer to Chapter 20, Fuel, Weather, Pressure and High-Temperature Sealing - Maintenance Practices.

NOTE: During structural repair, before the parts are sealed and put in position for the final installation, the parts must be drilled already, have a countersink or dimple, and be cleaned.

- (1) Remove all sealant from the area to be sealed.

NOTE: The best method to remove most of the sealant is to use a chisel-like tool made of hard fiber. The remaining sealant can be removed with aluminum wool but do not use steel wool or sandpaper.

- (2) Leave a taper on the remaining sealant.

NOTE: When the new sealant is applied, the taper will make a scarf bond and a continuous seal.

- (3) Use a vacuum to remove all chips, filings, dirt, etc., from the tank area.

- (4) Use Methyl n-Propyl Ketone or equivalent to clean all surfaces that you will seal. Dry all cleaned surfaces with a clean cloth before the solvent evaporates.

NOTE: Always put the solvent on the cloth to prevent contamination of the solvent. Do not let the solvent drip from the cloth. Dry the surfaces with clean, dry cloths until the white is removed. Never use dirty solvent.

- (5) Apply the fay-surface-sealant to one mating part and install the rivets or fasteners while the sealant is still in its work life.

NOTE: During the sealing procedure, you must monitor the supply of mixed sealant to be sure it is in its normal work life. To make sure, use a small wooden paddle, or tongue depressor to gather a small amount of the sealant. Touch this sealant to a piece of clean sheet metal. If it bonds, you can still use the sealant. If it does not bond, the sealant is not in its permitted work life and you must discard it.

- (6) Apply a fillet seal to the repaired area on the inside of the tank.

- (7) If necessary, apply a fay-surface-seal to the access door, the fuel quantity transmitter, etc.

- (8) If necessary, install the door(s).

- (9) Let the sealant cure.

- (10) Clean the stains on the outer surface.

- (11) Do a fuel tank leak test (Refer to Integral Fuel Bay Test).

8. Integral Fuel Bay Test

- A. The fuel system has two vented, integral fuel tanks (one in each wing). The following procedures are the integral fuel bay test.

- (1) Remove the vent line from the vent fitting and the cap fitting.

- (2) Disconnect the fuel lines from the bay.

- (3) To one of the bay fittings, attach a water manometer capable of measuring 20 inches of water.

- (4) To the other bay fitting, connect a well-regulated air supply (0.5 PSI maximum, or 13.8 inches of water).

NOTE: You can use nitrogen if the temperature changes during the test will have an effect on the bay.

- (5) Make sure the filler cap is installed and sealed.

CAUTION: Do not try to apply pressure to the bay without a good regulator and a positive shutoff in the supply line. Do not pressurize the fuel bay to more than 0.5 PSI or damage can occur.

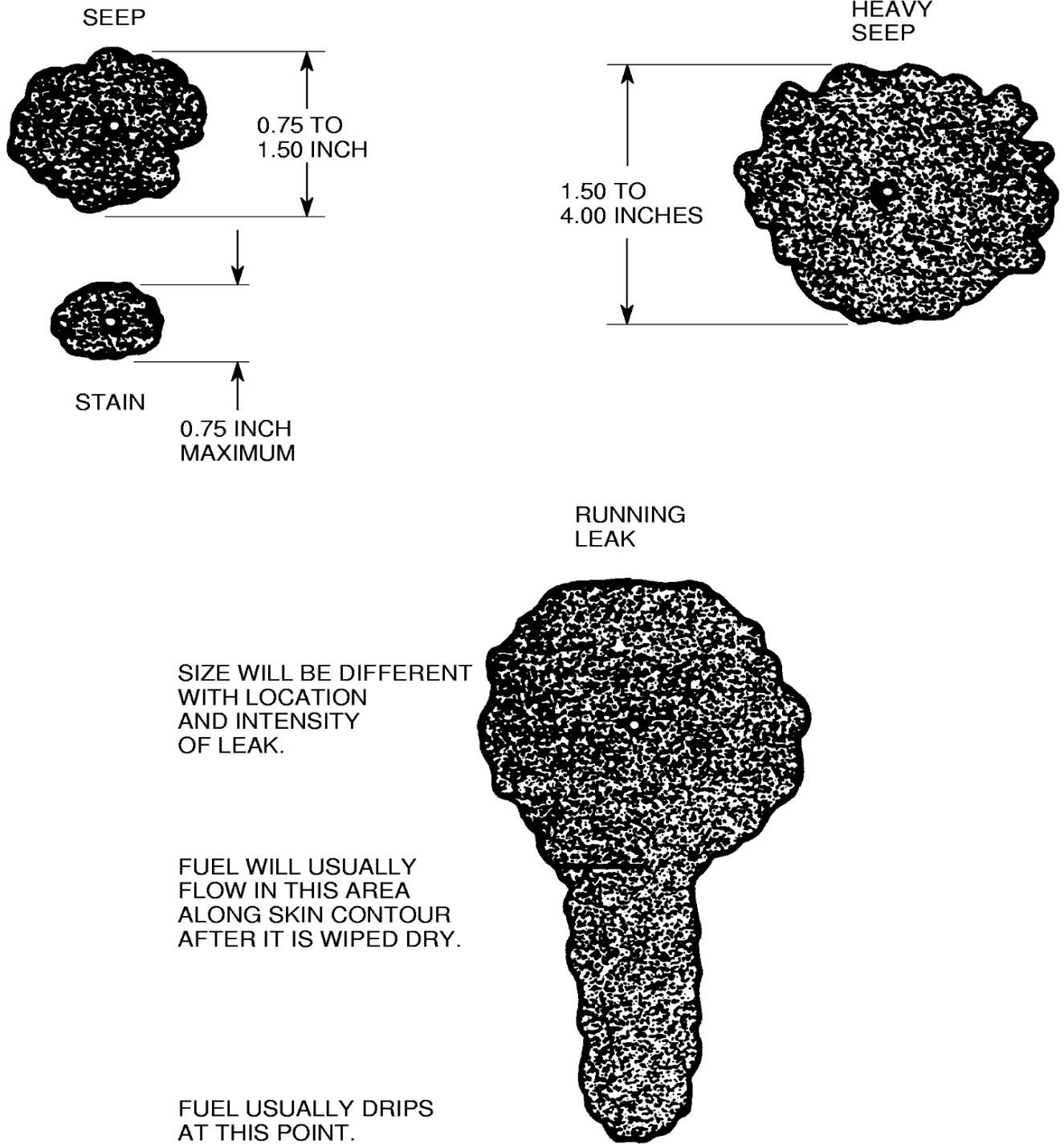
- (6) Slowly apply pressure until you get 0.5 PSI.

- (7) If necessary, apply a soap solution.

- (8) 15 to 30 minutes are necessary to let the pressure become stable.
- (9) If the bay holds the pressure for 15 minutes without a decrease in the pressure, the seal is satisfactory.
- (10) If there is a decrease in the pressure, seal the bay again and then do a fuel leak test.

Figure 201 : Sheet 1 : Fuel Leak Classes

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