

## ADHESIVES, CEMENTS AND SEALANTS SHELF LIFE AND STORAGE - DESCRIPTION AND OPERATION

### 1. General

- A. This section provides information which defines the proper storage and usable life (shelf life) of adhesives, cements and sealants which are used for maintenance and/or repair of the airplane. Also included in this section is the criteria used for testing these materials after the normal shelf life has expired, to determine if an extension to the shelf life is possible.
- B. Shelf life refers to a specified period of time usually from the date of manufacture (normally stamped or printed on the product container) to the expiration date (which should be determined using limits specified in Table 1) or if applicable, the manufacturer's expiration date printed or stamped on the product container) The specified shelf life is dependent on proper storage in accordance with the limits specified in this section and/or the manufacturer's instructions.

### 2. Storage Criteria

#### A. Storage of Adhesives and Cements.

- (1) All adhesives and cements shall be stored under controlled temperature conditions. If open shop storage becomes necessary, these products shall in no case be stored in an area which will subject them to temperatures in excess of 95°F. Containers shall be tightly closed prior to placing them in the proper storage environment. For definition of the proper storage environment, refer to Table 1 and the following paragraphs. For identification of adhesive and cement classifications, refer to Adhesive and Solvent Bonding - Maintenance Practices.
  - (a) Class I - These adhesives are epoxy base materials and have one-year storage at room temperature. 0°F storage will extend the storage life. Refer to the product container instructions for storage temperature and life.
  - (b) Class II, III and IV - These adhesives are rubber and resin base and are good for six months at room temperature storage. 40°F storage will extend the storage life. Refer to the product container instructions for limits of each adhesive.
  - (c) Class V - These are silicone rubber adhesives. If stored in their original containers at a temperature below 80°F, the shelf life is one year or as indicated on the storage container.
  - (d) Class VI - These are solvent bonding solvents. They should be stored in tightly closed, original containers at 40°F.
  - (e) Class VII - Cyanoacrylate base materials must be stored in the original containers at 40°F or as specified on the container instructions.
  - (f) Class VIII - These are pressure sensitive materials. The shelf life is two years when stored at 75°F and 50 percent relative humidity.
  - (g) Class IX - These are polyurethane products. Store in original container, between 70° and 100°F. Urethanes are moisture sensitive and precautions should be taken to ensure complete protection from moisture contamination. Container must be tightly closed at all times.
  - (h) Class X - These are acrylic base materials. They require storage at 40°F or per instructions on product container.

#### B. Storage of Sealants.

- (1) All sealants shall be stored under controlled temperature conditions. If open shop storage becomes necessary, these products shall in no case be stored in an area which will subject them to temperatures in excess of 95°F or below 40°F. Containers shall be tightly closed prior to placing them in the proper storage environment. For proper storage environment, refer to Table 1 and the following paragraphs. For identification of sealant classification, refer to Fuel, Weather and High-Temperature Sealing - Maintenance Practices.
  - (a) Premixed and frozen sealants shall be stored at -40°F or colder and shall not be used more than six weeks after the date of mixing, even if all storage is at -40°F or colder. If storage temperatures rise above -40°F, but are not warmer than -30°F, the material may be stored for a maximum of two weeks warmer than -40°F plus time at -40°F or colder for a combined total not to exceed five weeks beyond the date of mixing. If storage temperatures rise above -40°F but are not warmer than -20°F, the materials may be stored for a maximum of one week above -30°F plus time at -40°F or colder for a combined total not to exceed four weeks beyond the date of mixing.
  - (b) Unmixed sealants shall be stored at a controlled temperature of between 40°F and 80°F and have a shelf life of approximately six months when stored within this temperature range. Unmixed sealants stored at temperatures exceeding 80°F shall be used within five weeks.

- C. All materials should be used on a "first in, first out" basis. The adhesives, cements and sealants should be rotated so this requirement can be accomplished. All material containers should be clearly marked with a "use by" date, consisting of the year and month. All materials not used by this date must be tested prior to use. Refer to Testing Criteria and Table 1.

### 3. Testing Criteria

- A. Any material (adhesive, cement or sealant) not used within its shelf life will be tested and the results reviewed to determine if the material is usable. If there is doubt about the material being usable, it must be properly disposed of. Material that has exceeded its original shelf life may be retested to determine if the material meets its requirements. Materials meeting their requirements will have their shelf life extended as specified in Table 1. Materials with shelf life extensions must be retested after a specified period of time. Refer to Table 1.
- B. Testing of Overage Adhesives and Cements.

**NOTE: Overage adhesives and cements are those that have exceeded their original shelf life and must be tested prior to use and/or given extended shelf life.**

- (1) For identification of adhesive and cement classification, refer to Adhesive and Solvent Bonding - Maintenance Practices.
  - (a) Class I Epoxy Adhesive - Examine both components to ensure that they are still workable. Check for gelling and/or contamination. Stir components and mix a small amount of adhesive. Verify that adhesive sets up and hardens.
  - (b) Class II, III and IV Rubber and Resin Base Adhesives - Open containers and check for gelling and/or contamination. Check for spreading and drying.
  - (c) Class V Silicone Rubber Adhesives - Examine adhesive for hardness. If adhesive is still soft and can be spread, it is acceptable. Verify that adhesive will harden.
  - (d) Class VI Solvent Bonding Solvents - Check for signs of apparent contamination. Solvents should be clean and clear with no signs of cloudiness.
  - (e) Class VII Cyanoacrylic Base Adhesives - Verify that product is still liquid with no visible signs of contamination.
  - (f) Class VIII Pressure Sensitive Materials - Open containers and inspect for hardening, gelling and contamination. Stir components and mix a small amount of adhesive. Verify that adhesive sets up properly.
  - (g) Class X Acrylic Adhesives - Inspect base material to ensure that it is still liquid. Mix a small amount of the components and verify that it sets up properly.
- (2) In general, if these materials exhibit normal physical properties, with no signs of hardening, gelling or contamination and set up and/or harden properly as applicable, the shelf life may be extended as specified in Table 1.

- C. Testing of Overage Sealants.

**NOTE: Overage sealants are those that have exceeded their original shelf life and must be tested prior to use and/or given extended shelf life.**

- (1) For identification of sealant classification, refer to Fuel, Weather and High-Temperature Sealing - Maintenance Practices.
- (2) Overage sealants to be tested for possible shelf life extension shall be properly mixed using the correct materials, procedures and equipment.
- (3) Overage premixed frozen sealants, along with unmixed sealants should be visually inspected. Sealants which show conclusive evidence of separation, discoloration and/or gelling prior to the addition of a thinner or curing agent shall be discarded. When in doubt of the sealant quality, the overage sealant should be compared with the same type of sealant, under six months old, which is known to be satisfactory.
- (4) The mixed sealants may be tested by placing a small amount of sealant (sample buttons) on a sheet of paper. After the sample buttons have cured, they should be cut in half and examined. The sealant should show no signs of spots or streaks of unmixed base compound or curing agent. However, sample buttons containing spots, streaks, discoloration and/or variations in uniformity of color are acceptable if these spots, streaks, etc., are tack free upon inspection. All mixed sealant should be as void free as possible.
- (5) Contaminated sealant and premixed sealant that have been thawed and refrozen shall be discarded.
- (6) Type I, Class A sealants should be checked for appearance, application time, tack-free time, cure time and adhesion.
- (7) Type I, Class B sealants should be checked for appearance, application time, cure time, tack-free time and

adhesion. In addition, Class B-2 and B-4 sealants should be checked for initial flow.

- (8) Type I, Class C sealants should be checked for appearance, application time, cure time and adhesion. In addition, Class C sealants should be tested to determine that they are not at a tack-free condition at the end of their rated work life (squeeze out life).
- (9) Type II sealants should be checked for appearance, application time, tack-free time and cure time.
- (10) Type III sealants should be easily thinned with methyl n-propyl ketone. When difficulty is encountered in thinning this sealant, it should be discarded.
- (11) Type IV sealants should be checked for appearance, application time, tack-free time and cure time.
- (12) Type V and VI sealants should be checked for appearance, tack-free time and cure time.
- (13) Type VII sealants should be checked for appearance, application time, tack-free time and cure time.
- (14) Type VIII sealants should be checked for appearance, application time, tack-free time, cure time and adhesion. Adhesion to aluminum should be (peel) less than two pounds per inch of width.

**NOTE:** For application time, tack-free time and cure time for the above listed sealant types and classes, refer to Sealant Curing in Fuel, Weather and High- Temperature Sealing - Maintenance Practices. Also refer to Table 1., Storage and Shelf Life of Adhesives, Cements and Sealants.

**Table 1. Storage and Shelf Life of Adhesives, Cements and Sealants.**

PRODUCT	STORAGE CONDITION (TEMPERATURE)	SHELF LIFE	EXTEND SHELF LIFE	RETEST IN LIFE
<b>ADHESIVES AND CEMENTS</b>				
EA9309.3NA	40 to 80°F	12 Months	6 Months	6 Months
EA9339	40 to 80°F	12 Months	6 Months	6 Months
EA9314	40 to 80°F	12 Months	6 Months	6 Months
EA9330	40 to 80°F	12 Months	6 Months	6 Months
EA907	40 to 80°F	12 Months	6 Months	6 Months
Devcon F	40 to 80°F	12 Months	6 Months	6 Months
EA934NA	40 to 80°F	12 Months	6 Months	6 Months
380/6	40 to 80°F	12 Months	6 Months	6 Months
A1186-B	40 to 80°F	12 Months	6 Months	6 Months
EC2216	40 to 80°F	12 Months	6 Months	6 Months
#10 Fastset	40 to 80°F	12 Months	6 Months	6 Months
608 Quickset	40 to 80°F	12 Months	6 Months	6 Months
EC880	40 to 80°F	8 Months	3 Months	3 Months
EC847	40 to 80°F	8 Months	3 Months	3 Months
EC1300L	40 to 80°F	* 6 Months	* 3 Months	* 3 Months
5452	40 to 80°F	12 Months	6 Months	6 Months
5431	40 to 80°F	12 Months	6 Months	6 Months
1636	40 to 80°F	12 Months	6 Months	6 Months
EC2262	40 to 80°F	12 Months	6 Months	6 Months
RTV-157	40 to 80°F	12 Months	6 Months	6 Months
RTV-158	40 to 80°F	12 Months	6 Months	6 Months
RTV-159	40 to 80°F	12 Months	6 Months	6 Months
RTV-732	40 to 80°F	12 Months	6 Months	6 Months

RTV-102	40 to 80°F	12 Months	6 Months	6 Months
RTV-103	40 to 80°F	12 Months	6 Months	6 Months
RTV-106	40 to 80°F	12 Months	6 Months	6 Months
RTV-108	40 to 80°F	12 Months	6 Months	6 Months
RTV-109	40 to 80°F	12 Months	6 Months	6 Months
RTV-94-034	40 to 80°F	12 Months	6 Months	6 Months
Loctite 222	40 to 80°F	12 Months	6 Months	6 Months
Loctite 242	40 to 80°F	12 Months	6 Months	6 Months
Loctite 271	40 to 80°F	12 Months	6 Months	6 Months
Loctite 277	40 to 80°F	12 Months	6 Months	6 Months
Loctite 290	40 to 80°F	12 Months	6 Months	6 Months
Loctite 416	40 to 80°F	12 Months	6 Months	6 Months
Loctite 495	40 to 80°F	12 Months	6 Months	6 Months
Loctite 515	40 to 80°F	12 Months	6 Months	6 Months
Loctite 569	40 to 80°F	12 Months	6 Months	6 Months
Loctite 592	40 to 80°F	12 Months	6 Months	6 Months
Loctite 595	40 to 80°F	12 Months	6 Months	6 Months
Loctite 609	40 to 80°F	12 Months	6 Months	6 Months
Loctite 620	40 to 80°F	12 Months	6 Months	6 Months
Loctite 680	40 to 80°F	12 Months	6 Months	6 Months
Loctite 12829	40 to 80°F	12 Months	6 Months	6 Months
Loctite 12839	40 to 80°F	12 Months	6 Months	6 Months
DA-552-1	40 to 80°F	12 Months	6 Months	6 Months
PS-18	40 to 80°F	12 Months	6 Months	6 Months
PS-30	40 to 80°F	12 Months	6 Months	6 Months
XA-3678	40 to 80°F	12 Months	6 Months	6 Months
XF-3585	40 to 80°F	12 Months	6 Months	6 Months
LR-100-226	40 to 80°F	12 Months	6 Months	6 Months
EC776	40 to 80°F	* 8 Months	* 3 Months	* 3 Months
SB and P-2	40 to 80°F	12 Months	6 Months	6 Months
<b>SEALANTS</b>				
Pro-Seal 890	40 to 80°F	6 Months	2 Months	2 Months
GC-408	40 to 80°F	6 Months	2 Months	2 Months
PR-1422	40 to 80°F	6 Months	2 Months	2 Months
PR-1440	40 to 80°F	6 Months	2 Months	2 Months
GC-435	40 to 80°F	6 Months	2 Months	2 Months
Pro-Seal 567	40 to 80°F	6 Months	2 Months	2 Months
PR-810	40 to 80°F	6 Months	2 Months	2 Months
Pro-Seal 700	40 to 80°F	6 Months	2 Months	2 Months

GC-1900	40 to 80°F	6 Months	2 Months	2 Months
PR-366	40 to 80°F	6 Months	2 Months	2 Months
Pro-Seal 706B	40 to 80°F	6 Months	2 Months	2 Months
Pro-Seal 735	40 to 80°F	6 Months	2 Months	2 Months
Pro-Seal 870	40° to 80°F	9 Months	4.5 Months	4.5 Months
Pro-Seal 895	40 to 80°F	6 Months	2 Months	2 Months
PR-1321	40 to 80°F	6 Months	2 Months	2 Months
GC-200	40 to 80°F	6 Months	2 Months	2 Months
RTV-730	40 to 80°F	6 Months	2 Months	2 Months
Pro-Seal 815	40 to 80°F	6 Months	2 Months	2 Months
GC-402	40 to 80°F	6 Months	2 Months	2 Months

**NOTE 1:** \* Do not use after three months of storage in the 81°F to 90°F range. Do not use after five days of storage above 90°F.