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REPUBLIC OF NAMIBIA

NAMIBIA CIVIL AVIATION AUTHORITY

AERONAUTICAL INFORMATION CIRCULAR

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AIRWORTHINESS
CAUTION
AIRCRAFT FABRIC COVERING AND PRECAUTIONS DURING RECOVERING OPERATIONS

1. The purpose of this circular is to draw the attention of all concerned with the maintenance of fabric covered aircraft to the necessity for ensuring that the fabric on these aircraft is kept constantly under surveillance for any signs of deterioration.
   1.1. It is an inherent characteristic of fabric materials that, notwithstanding any protective treatment or other attention they may receive, certain factors such as the effects of the sun's harmful ultra violet rays, climatic conditions, etc., combined with the passage of time and usage, cause deterioration of the fabric. Because of this, certain limits to the reduction in the acceptable tensile strength of fabric have been imposed, and these must be observed by all concerned during maintenance operations on aircraft.
2. In order to preclude the possibility of an aircraft being operated in an un-airworthy condition, one of the requirements of the inspections prescribed by the NAM-CATS-GMR 43.02.5 is that the fabric covering and dope on an aircraft be checked for condition during these inspections.

   It is stressed that the only really satisfactory method of assessing the condition of fabric is by means of a physical test of its tensile strength.
   2.1. There are two methods whereby the strength and serviceability of fabric may be tested. The first is by the removal of samples of fabric from the aircraft, which, after preparation to the correct and accurate dimensions, are subjected to a tensile load to destruction in a test machine designed for this purpose. The second is a test conducted with the fabric in situ by means of hand held piercing or pressure type test instruments. In both the above-mentioned test procedures it is imperative that all the dope is completely removed from the test sample in the area under test, otherwise the test results may not be accurate.
   2.2. It must be borne in mind when using hand held piercing or pressure type test instruments, that the results of these tests will only be approximate values of the fabric strength in the areas under test. However, provided these tests are done in accordance with the particular instructions issued by the makers of these instruments and the results obtained are well within the prescribed deterioration limits, these results may be accepted. If the test results are in any way marginal, samples of the fabric must be removed from the areas concerned

and subjected to an accurate test in a tensile testing machine in a laboratory or other reliable venue with suitable test equipment.

2.3. Where tests show that the fabric has deteriorated to the extent that its tensile strength is 70 percent or less of its original new strength i.e. it has lost 30 percent or more of its original strength, it is to be considered unserviceable and must be replaced before the aircraft flies again.

2.4. When evaluating the results of fabric tests, licensed Aircraft Maintenance Engineers (LAME) and Licensed Aircraft Maintenance Organisations (LAMO's) must refer to, and use the strength deterioration limits given in the table in Figure 3.1 of Chapter 3, Section 1, of FAA Advisory Circular AC No. 43.13.1A. The limits shown in this circular which may be applied to both linen and mercerized cotton fabrics are not to be exceeded under any circumstances.

3. LAME and LAMO's must exercise care when conducting tests on fabric to ensure that representative areas of the whole fabric covering are selected for test, and that due regard is given to areas where deterioration is likely to be accelerated by the direct rays of the sun, oil or fuel soakage, battery acid fumes, acid spillage, or other reasons.

3.1. It should always be borne in mind that the amount of testing to which the fabric covering is subjected is normally dependent on the age of the fabric concerned and that the injudicious use of hand testing instruments and the overgenerous piercing of fabric over large areas, with detrimental effects to the fabric finish and appearance, is likely to be a source of annoyance to aircraft owners. Therefore the selection of the areas to be tested where the age or the condition of the fabric dictates this necessity, should always be left to someone whose experience is commensurate with this phase of aircraft maintenance.

4. It is considered appropriate also to draw attention in this Circular to the use of unapproved finishes such as paints and enamels for application to fabric covering. Certain of these materials are known to accelerate the deterioration rate of fabric and in addition they may not have the required fire resistant properties. Any aircraft, on which the fabric has been so treated with unapproved materials, must be treated as suspect until such time as action has been taken to rectify the problem. Maintenance personnel should bear this in mind when maintenance work is undertaken in respect of such aircraft.

5. In view of the above, LAME and LAMO's responsible for certifying inspections on fabric covered aircraft must ensure before certifying these inspections that the fabric has not deteriorated beyond the acceptable limits. The results of fabric tests must be recorded in the aircraft logbook so that where these tests reveal that the fabric strength is nearing the unsafe limit, action can be taken to re-test the fabric before any further serious deterioration beyond such limit takes place.

6. During periodic and pre-flight inspections aviators must pay attention to the following:

6.1. Condition of all seams and lapped and doped joints;

6.2. Surface tapes should be securely doped into place;

6.3. Lacing cords must be checked for failure and tightness;

6.4. Drain holes should be unobstructed;

6.5. There should be no sign of dope separation, whorls, cracks and splits in the finishing coats of paint should be brought to the attention of the AMO immediately, and

6.6. The entire surface must be free from cuts, tears or any other damage.

7. When fabric covering has to be renewed due to deterioration or when repairs are to be effected, certain precautions should be taken irrespective of the type of covering being used, especially on older aircraft. If any of the following conditions exist and even one left uncorrected, the structural integrity of the fuselage will be compromised:
   7.1. Excessive rust and corrosion between steel tubing and preformed sheet steel material, which is welded to the tubing in doorframes, windshield and baggage areas of the fuselage, creating blind areas;
   7.2. Mis-alignment of tubular members, dents, cracks, worn bolt holes and/or parts;
   7.3. Corrosion protection should be applied as per the manufacturers specifications or as per AC 43.13-1A. (This requires special attention and the importance thereto cannot be over emphasised);
   7.4. Lacing cords and surface tapes as prescribed for a particular application should be used in accordance with the manufacturer's specifications as approved by the Executive Director.