

NATIONAL AIRCRAFT STANDARDS COMMITTEE

AIRCRAFT INDUSTRIES ASSOCIATION OF AMERICA, INC., 610 SHOREHAM BUILDING, WASHINGTON 5, D. C.

SPECIFICATION - PARACHUTES

This specification defines the minimum performance and safety standards for parachutes to be used in certificated aircraft.

1. APPLICABLE SPECIFICATIONS

1.1 None.

2. TYPES

2.1 This specification covers two types of man-carrying parachutes for use in certificated civil aircraft

Standard Type Parachute

Low Speed Type Parachute (Up to 150 miles per hour).

3. MATERIAL AND WORKMANSHIP

3.1 Materials shall be of a quality which experience and/or tests have conclusively demonstrated to be suitable for use in parachutes. Workmanship shall be consistent with high-grade parachute manufacturing practice.

3.1.1 Canopy Material: The fabric used in the canopy construction shall be free from harmful gums, starches and other foreign material. It shall also be free from avoidable imperfections in manufacture and from defects or blemishes affecting its strength or durability and shall have been finished without application of excessive heat. The canopy material shall have sufficient resilience to insure proper opening of the canopy under conditions outlined in 4.3.5.

3.1.2 Fitting Materials: Fittings shall be fabricated from carbon steel, alloy steel, or corrosion-resisting material. Fittings made from metals that are not corrosion-resisting shall be plated or otherwise protected, to resist corrosion during the normal life of the parachute. The use of dissimilar metals, especially brass, copper, or steel in intimate metal-to-metal contact with aluminum or aluminum alloy, shall be avoided, wherever possible.

4. DETAIL REQUIREMENTS

4.1 Design and Construction

4.1.1 Fittings: All fittings shall be designed to carry their full rated load without yielding.

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- 4.1.2 Suspension Lines: All suspension lines of a given model parachute shall be marked under equal tension to show points of attachment.
- 4.1.3 Stitching: Stitching shall be of a type that will not ravel when broken.
- 4.1.4 Rip Cord: The rip cord, including joints between the handle and the release, shall be designed to withstand the tension test load of 4.3.1.
- 4.1.5 Pack Opening Device: No more than 22 pounds pull shall be required to cause the positive and quick functioning of the pack opening device.
- 4.1.6 Harness Release: The harness shall be so constructed that the rider can release himself and drop clear in case of a water landing, but a quick-attachable or quick-releasing device between the harness and the parachute is not mandatory.

4.2 Marking

- 4.2.1 Pack: The following information shall be legibly and permanently marked on or attached to the outside of the parachute pack by use of a name plate, identification label or stenciled letters.

Manufacturer's name
Model number or model name*
Parachute serial number
Date of manufacture
National Aircraft Standard Number (NAS804)

*Note: Special designation or identification of low speed type parachutes must be indicated on the outside pack by stenciling in red letters one inch high the following: "Low Speed Parachute" and in red letters one-half inch high, "Limited to Use in Airplane Under 150 MPH."

- 4.2.2 Canopy: Each parachute canopy shall be legibly and permanently marked, preferably adjacent to the skirt, with the same information as in 4.2.1.
- 4.2.3 Harness: The parachute model number or model name and date of manufacture shall be stenciled on all harnesses. This marking shall be placed inside the back strap of the harness or other suitable location where it will be subject to minimum of obliteration.

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4.2.4 Inspection Data Pocket: Each parachute outfit shall be provided with an inner and an outer pocket for keeping a record card containing space for recording the date of repacking or repair and the rigger's name and serial number. The inner pocket shall be located in the center of the packed container, tray or frame and the outer pocket placed externally in an easily accessible position. If the inner record card can be read from the outside of the pack because of the use of transparent materials, only the inner pocket need be provided.

4.3 Qualification Tests: 100% performance in qualification tests 4.3.1 through 4.3.8 is required.

4.3.1 Rip Cord Tension Test: The rip cord, including joints between the handle and the release, shall not fail under a straight tension test load of 300 pounds applied for not less than three seconds.

4.3.2 Pull Test - Pack Opening Device: The pack opening device shall be tested by use of an accurate spring balance to indicate its positive and quick-functioning with no more than 22 pounds pull.

4.3.3 Functional Test (Normal Pack): Twelve drops at least six of which shall be from an airplane with a 170-pound dummy man, from an altitude of not more than 500 feet. The indicated air speed at the time of release shall be 70 miles per hour. No twists shall purposely be packed in the suspension lines. The parachute must be fully open within three seconds from time of release.

4.3.4 Functional Test (Twisted Lines): Five drops with a 170-pound dummy man, from an altitude of not more than 500 feet. The indicated air speed at the time of release shall be 70 miles per hour. Three twists shall purposely be packed in the suspension lines near the skirt. The parachute must be fully open within four seconds from time of release.

4.3.5 Compressed Pack Test: This test is required only when canopy materials other than pongee, silk or nylon are used (Ref. 3.1.1). Three drops with the conditions stated in 4.3.3 except that prior to the tests the parachutes completely packed shall be subjected continuously to a 200-pound weight for 400 hours and then dropped without being repacked.

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4.3.6 Strength Test

- 4.3.6.1 Standard Type Parachute: Three drops with a parachute of the same type at an altitude of not more than 500 feet shall be made with a dummy weight and indicated air speed to give the equivalent of 5000 lbs. shock load. (See Table I.) No twists shall purposely be packed in the suspension lines. The weight shall be attached to the harness. No external shock absorbers or material which may act as such shall be permitted. The parachute shall show no failure of any material.

Table I

Launching Speeds & Total Weights for Approx. 5000# Shock Load *

<u>Speed - MPH</u>	<u>Total Weight (Incl. Chute) - lbs.</u>
150	660
175	500
200	400
225	325
250	275
275	225
300	200
325	175
350	160
375	150

* Data computed for 28 ft. Standard Flat-Type Parachute based on USAF Parachute Handbook Section V.

- 4.3.6.2 Low Speed Type Parachute: Three drops with a parachute of the same type at an altitude of not more than 500 feet shall be made with a dummy weight and indicated air speed to give the equivalent of 3000 lbs. shock load. No twists shall purposely be packed in the suspension lines. The weight shall be attached to the harness. No external shock absorbers or material which may act as such shall be permitted. The parachute shall show no failure of any material.

Table II

Launching Speeds & Total Weights for Approx. 3000# Shock Load *

<u>Speed - MPH</u>	<u>Total Weight (Incl. Chute) - lbs.</u>
100	750
125	525
150	375
175	300
200	235
225	200

* Data computed for 28 ft. Standard Flat-Type Parachute based on USAF Parachute Handbook Section V.

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4.3.7 Live Drop Tests: Two live drop tests from an airplane with a man weighing approximately 170 pounds, including the weight of an additional certificated auxiliary parachute, from an altitude of 2000 feet on a comparatively still day. The rider must suffer no discomfort from the opening shock and must be able to disengage himself unaided from the harness after landing. For this test the standard harness may be altered to permit attachment of an auxiliary parachute provided that such alteration does not interfere with the normal operation of the parachute and harness equipment being tested.

4.3.8 Rate of Descent Test: At least six drops from an airplane with a 170-pound dummy man. The average rate of descent shall not exceed 21 feet per second for the last 100 feet under standard sea level altitude conditions. A method shall be employed for direct and accurate measurement of rate of descent for the last 100 feet, such as the use of a weighted cord or cable by which the descent may be timed from the time of ground impact of the weight to ground impact of the parachute.

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