SAE Aerospace
An SAE International Group

AEROSPACE RECOMMENDED PRACTICE

SAE ARP495

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Superseding ARP495C

Passenger Evacuation Devices - Civil Air Transport

CANCELLATION NOTICE

This document has been declared "CANCELLED" as of May 2004. By this action, this document will remain listed in the Numerical Section of the Aerospace Standards Index.

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1. SCOPE:

1.1 This Aerospace Recommended Practice (ARP) establishes criteria for design and installation of devices that will ensure rapid and effective occupant evacuation in the event of emergency.

1.2 Field of Application: This ARP deals with emergency evacuation devices installed for the purpose of rapidly assisting the occupants to the ground or water from emergency exits and/or wings.

NOTE: This document is not intended to specify design methods, mechanisms, or equipment to be used in the accomplishment of the objectives set forth herein.

2. REFERENCES:

2.1 Applicable Documents:

Federal Test Method Standard 191, in effect December 31, 1968, Method 5136 and Method 5970

ARP503D Emergency Evacuation Illumination
ARP577B Emergency Placarding - Internal and External

MIL-STD-810D Environmental Test Methods of Engineering Guidelines

3. TECHNICAL REQUIREMENTS:

3.1 General:

3.1.1 The passenger evacuation device, including any inflation system it may be provided with, shall be capable of functioning after exposure for 24 hr at all temperatures throughout the temperature range of -40 to +160°F (-40 to +70°C).

3.1.2 Materials and processes used in the construction of the evacuation device shall be resistant to flame (self-extinguishing), ozone, fungus, blocking, and air holding deterioration. (For air holding deterioration resistance test methods, refer to Appendix 1.) Exposure to salt spray, sand and dust, spillage of beverages, aircraft cleaning agents, de-icing fluids, jet engine fuel, and hydraulic fluid shall not impair the operation and use of the device.

3.1.3 The structural member of the device shall be either protected by or constructed of materials that are resistant to degradation from ultraviolet radiation.

3.1.4 The evacuation device and its fastenings shall be so constructed that static electricity will not be generated in sufficient quantity to cause a spark that could ignite a fuel/air mixture. The surface resistivity of any sliding surface shall not exceed 1 MΩ when measured on any square sample not less than 5 in^2.

3.1.5 The device shall be installed in such a manner that in the event of an emergency, it will be available for immediate deployment.

3.1.6 The device shall be capable of providing for the maximum evacuation rate consistent with the flow potential of the exit.

3.1.7 The device shall be capable of being actuated by untrained evacuees. The location and design of the manual backup inflation handle and the slide release handle shall be such as to preclude their being easily confused by either trained or untrained personnel. It shall be capable of being automatically deployed and inflated. The method of operation shall be conspicuously and clearly indicated by brief instruction placards. Placards and emergency lighting shall be in conformity with ARP577B and ARP503D, respectively.

3.1.8 If the evacuation device is an inflatable device equipped with pressure relief valves, these valves shall be set at an acceptable pressure to ensure satisfactory operation.

3.1.9 The evacuation device shall be designed and constructed to be highly resistant to catastrophic failure of the structural members or sliding surface(s) as a result of evacuees jumping on the device in normal street attire with shoes on. The sliding surface shall be puncture and tear resistant and shall comply with the following standards.

Puncture resistance (MIL-T-6396E)-47 lbs (20 daN)
Tear resistance (Method 5136)-38 lbs (17 daN)

3.1.10 The pressure holding envelope shall be resistant to a radiant heat level of 1.5 Btu/ft^2 - s (1.31 x 10^{-3}W/M^2) for 180 s.

3.1.11 The device, while attached to the aircraft, shall be capable of being deployed and inflated properly with the aircraft in its ditched condition. Manual inflation is an acceptable means of compliance.

3.2 Attachment to the Aircraft:

3.2.1 The attachment of the passenger evacuation device to the aircraft, for use during evacuation shall have a minimum strength equal to at least 1.5 times the highest design load imposed on the device during use.

3.2.2 Any device having positive buoyancy when extended shall have a means to readily disconnect the device from the aircraft so that it also can be used as an emergency flotation device. In addition, a static line shall be provided in such a manner that the device shall automatically remain secured to the aircraft when it is used as an emergency flotation platform. The static line shall be a minimum length of 25 ft (7.62 m) and have a knotted breaking strength of 500 to 1000 lbf (227 to 454 daN) depending on the buoyancy of the device. The attachment to the evacuation device shall be stronger than the static line. The static line shall not interfere with the operation of the device.

3.3 Use As a Ground Evaucation Device:

3.3.1 The device shall not depend upon persons on the ground for operation; however, the device shall provide a means whereby two or more persons on the ground may provide support should the device fail to inflate or erect properly.

3.3.2 Winds up to 25 knots (min) from any direction parallel to the ground shall not adversely affect the usability of the device.

3.3.3 The inflation time, measured from the point of activation of the erecting mechanism, after complete deployment from the storage compartment, until the device is in its usable condition shall be a maximum of 6 s for slides and slide/rafts and 10 s for off-wing devices in still air and 70°F (21°C) temperatures. The device shall remain usable for a minimum of 10 min after inflation/erection.

3.3.4 The automatic activation system shall have an easily activated and conspicuously operated back-up system. For door-mounted evacuation systems it shall be possible to readily deactivate the automatic deployment feature before opening the exit. In addition, unless the device deploys over the wing to the ground, the device shall not activate unless it has been deployed at least 12 in below the exit sill during the initial stage of deployment.

3.3.5 Use of the device after inflation must be self-evident.

3.3.6 The configuration of the device, when inflated, shall impart a sense of security and confidence in its use by the occupant so that maximum rates of escape may be maintained.

3.3.7 The device shall be suitable for assisting occupants to the ground from the exit under all combinations of landing gear conditions.

3.3.8 The device shall permit occupants, including young children, aged persons, and ambulatory persons to evacuate rapidly with a minimum probability of incurring injury.

3.3.9 The device shall not impede evacuation where its use is not required.

3.3.10 The inflated device shall provide a means for reentry to the aircraft.

3.3.11 It shall be possible to replace the device in 60 min with a like device, once the device has been activated.

3.3.12 The passenger escape device shall be designed as part of the total evacuation system of the aircraft.

3.4 Use As A Supplementary Flotation Platform:

3.4.1 When capable of use in a ditching, the device shall comply with 3.3.4 and 3.3.8.

3.4.2 The method of disconnecting the device from the aircraft shall be conspicuously and clearly indicated by brief instruction placards in conformity with ARP577B.

3.4.3. It shall be possible to separate the static line from the device quickly and easily after disconnecting the device from the aircraft. The disconnect means shall be readily apparent with appropriate placarding and shall be capable of operation by untrained evacuees.

3.4.4 The device shall provide a continuous support line along each of its longitudinal sides for use by evacuees in the water. These support lines shall not compromise its use during use as a ground escape device.

3.4.5 The device shall remain inflated to full design buoyancy for a minimum of 6 hr.

3.5 Use as an Assist Device at Overwing Exits:

3.5.1 The device shall comply with 3.3.2, 3.3.5, 3.3.6, 3.3.7, 3.3.8, 3.3.9, and 3.3.11.

3.5.2 The automatic activation system shall also have a manually activated back-up system. It shall be possible to readily deactivate the automatic deployment feature before opening the exit.

3.5.3 The device shall provide the most direct route from the exit at which it is installed to the ground escape device or raft.

3.5.4 Where ropes are used, the existence of the rope and method of use shall become self-evident upon using the exit.