



AUSTRALIAN PARACHUTE FEDERATION

PO Box 1440, Springwood Qld 4127
P-(07) 34570100 apf@apf.com.au / www.apf.com.au

EQUIPMENT STANDARD No. APF260721-A

Issued 26 July 2021

(Replaces APF RAC222B dated 01 July 1995)

SUBJECT: APF DESIGN STANDARD FOR FLAG ASSEMBLIES.

STATUS: MANDATORY

IDENTIFICATION:

For the purpose of this standard, a flag is defined as a flag, banner, streamer or any similar equipment that has a weight attached and is carried by a parachutist and which may constitute a danger to the public.

BACKGROUND:

The APF requires that equipment used for the carriage and attachment of flags on a display shall:

- (i) comply with the design standard in this Equipment Standard,
- (ii) be approved by a STO or Rigger,
- (iii) be used on 2 training jumps prior to a display,
- (iv) if a flag recovery parachute is fitted it should be trialed on one of the 2 training jumps,
and
- (v) used in accordance with the APF Display Manual rules.

APF DESIGN STANDARD:

For the purpose of this standard equipment shall be classified by size and/or weight as follows: (should the equipment fall into 2 categories re. size/weight, it shall be classified in the larger)

Small, up to 1000 sq ft or 12kg total weight.

Medium, from 1001 to 2000 sq ft or 30kg total weight.

Large, 2001 to 5000 sq ft or 50kg total weight.

Very large, over 5000 sq ft or over 65kg.

CONTAINER:

The flag container shall be constructed to securely retain the flag and weight assembly to the parachutist during freefall and canopy deployment. Although the design may not need to cope with terminal velocity opening shock loads it is recommended the design should retain the contents without inadvertent release or failure at 8g's. (8g's being equivalent to a hard opening).

The flag container assembly shall be constructed such that the flag and weight is not able to slump in the flag container (i.e., a reasonably tight fit).

The flag container should be constructed from robust material. It is recommended 420 denier parapac or equivalent be used for small and medium size flag containers and 1000 denier cordura or equivalent for larger sizes.

The flag container for large and very large flags shall be fabricated with structural webbing sewn externally to surround the flag container. The webbing shall incorporate the anchor points for attaching the flag container to the harness and the closing mechanism.

Where the flag container is mounted on the front of the body the width of the flag container shall not inhibit access to the cutaway and reserve ripcord handles.

The opening and closing mechanism on all flag containers shall incorporate a safety catch so that it requires two actions to open. Small and medium flags may use velcro and press studs (or similar). Large and very large shall use a multiple pin and loop closure system (or equivalent) with an operating handle that is itself secured to prevent inadvertent release.

HARNESS:

Flag assemblies will use a separate harness worn under the parachute harness, or a tandem parachute harness. A tandem parachute harness and tandem container is highly recommended as there are shoulder and side attachment points which are suitable for direct attachment of a flag container assembly.

FLAG ATTACHMENT / RELEASE:

Flag assemblies will incorporate a means of releasing an unpacked flag in the event of an emergency. Flag assemblies will incorporate a 3-ring release or equivalent release-under-load device. Where a 3-ring or similar is used the operating handle will incorporate a safety catch so that it requires two actions to release.

To avoid an offset load, flags shall be configured so that they are suspended from a central point below the parachutist.

A hook knife shall be carried on all flag descents. The hook knife shall be of suitable size and design for the equipment being used and shall be a suitably large hook knife which must be accessible both before and after flag deployment.

Where it becomes necessary to release a flag during the descent, the parachutist shall take every measure to reduce the risk of causing injury or damage to persons on the ground.

Flags, flag weights, flag recovery parachutes, and their attachment to the parachutist should not incorporate knots. Where knots are used the material strength shall be double that recommended under 'flag weight'. (Knots can reduce webbing strength by 50%).

FLAG WEIGHT:

The weight shall be contained in a bag constructed of robust material. 1000 denier cordura has been found to be acceptable. The weight bag shall have external webbing that surrounds the base of the bag and incorporates the attachment to the flag. The bag shall be free of seams at the base.

Material in the weight bag may be granular lead shot or sand (or equivalent), at no more than 5g per particle, are considered acceptable materials.

Materials used to transmit loads from the parachutist to the flag weight, including the leading edge of the flag, shall have a minimum tensile strength of (20 x the total suspended weight). Nylon is preferred over polyester for absorbing the loads associated with deploying the weight as nylon stretches up to 30% compared to 15% for polyester.

Hardware, where used, shall be forged and be free of sharp edges which could cause damage and/or failure of other materials. Webbing shall be synthetic. Sewing thread shall be of appropriate size and shall be of the same material as that being sewn.

PARACHUTES USED FOR FLAG DESCENTS:

The parachute assembly (including the reserve) shall be suitably sized to carry the combined weight of the parachutist and flag assembly.

Typical gross weights are:

Small 95kg (70 kg jumper, 15kg flag assembly, 10kg parachute)

Medium 105kg (70 + 25 + 10)

Large 125kg (70 + 40 + 15)

Very large 165kg (70 + 70 + 15)

PACKING / DEPLOYING FLAGS:

The packing of the flag shall be such that the flag is able to unfurl in an orderly manner. It has been determined that bringing the trailing edge of the flag up to within 1 metre of the leading edge, then folding the flag towards the leading edge (in container width folds) is an acceptable means of packing to avoid the flag forming a "spinnaker" and malfunctioning.

In order to prevent entanglement between the flag and the weight, the flag weight shall be stowed so it deploys before the flag.

Prior to a display jump the method of packing the flag and weight shall be trialed on at least two training jumps.

APPROVAL:

Prior to use at a display, and after any significant alteration, a flag assembly including its component parts shall be approved by a STO or Rigger.

DISPUTE RESOLUTION:

Where a flag owner/parachutist and STO/Rigger are unable to agree on the interpretation of this standard the matter shall be referred to the Rigging committee to resolve.

COMPLIANCE DATE: Immediately

AUTHORITY: National Aviation Officer, Safety and Training Manager

DISTRIBUTION: All STO's, Licensed Display Examiners, APF Riggers