
APCO

LIFT ME UP

With the Lift, Apco aim to bring their Force reflex wing to a wider audience. Sascha Burkhardt tries it on

The Force was the first Apco wing designed with a distinct reflex profile. But this wing wasn't intended for new pilots. In particular, the speed with which the canopy inflates and the equally high speed during landing makes this wing appear little suited to less-experienced pilots.

The Lift then was developed based on the profile and basic shape of the Force, but it has a different aspect ratio and line set. The specification makes it clear that this is first and foremost a canopy for beginners. The highest priority is safety. Thanks to its high pitch and roll stability, the wing is suitable for a pilot's very first flight and should still be appropriate long into the pilot's career.

Launch and Speed

The second priority was simple launch and landing characteristics. In these areas the Lift was clearly meant to iron out some of the weaknesses of the Force. Speed is the third priority in the specification – the widest possible speed range with a large margin in the lower speed range. Anatoly Cohn and his developer Adam Wechsler also felt it was essential to offer prospective pilots long brake travel. Furthermore, they wanted to keep fuel consumption low.

Construction

As is usual on Apco wings, the fabric used for the Lift is the high silicon content 42 g/m2 material produced by Gelvenor. The gallery lines are unsheathed and the main lines are 1.9mm thick. The colour coding on the lines is intuitive. The risers are thick and marked with "A" and "B", as is normal on Apco wings. The trimmers are provided with precise markings. In order for it to require fewer lines and therefore reduce drag, the Lift is designed as a hybrid three-liner.

And of course the Lift is fitted with flexon battens. Just as a reminder, Apco has used these rigifoils for a considerable time now; they were possibly the first manufacturer to do so.

As with the Force, some special features of the Lift are the High-Speed Intake Valves (HIT valves) and the Stall Recovery System (SRS).

The HIT valves should maintain the canopy's inner pressure at low angles of attack. They are flutter valves made from gauze and cloth, which open when the canopy is flying at higher speeds.

Clearly it is difficult to ascertain how and to what extent these contribute to the already existing wing stability, especially since the valves are relatively small compared to the overall sail area.

It is also difficult to judge the effectiveness of the SRS, although Apco seems to have used this system successfully for some time. To an extent, the front and back risers can slide (the back risers lengthen when the front risers shorten) and this should delay stalling at lower speeds.

The wing curvature is very noticeable on the Lift – it is very flat in the middle section and the tips are clearly pulled down. This shape should usually aid roll stability, whilst at the same time deeply pulled down stabilos permit efficient turning.

One reason for this is that at the moment of brake input the lift vector is above the centre of gravity and therefore will assist the initiation of the turn, despite adverse roll.

The canopy has several folds and sometimes very noticeable ballooning, but this may be desirable to dampen the wing.

◄ ▼SIMPLE AND CLEAN
The glider in flight; the HIT valves are flutter valves made of gauze and cloth; the riser set. Photos: Véronique Burkhardt

About the reviewer

Sascha Burkhardt flew the Lift M over several days in winter at altidudes varying from sea level to 1,700m AMSL. He used a Fresh Breeze Thorix 200 and a Fly Products Rider Moster 185 at an all-up weight of 134-144 kg.

▲LEADING EDGE
The wing curvature is very noticeable on the Lift, it is very flat in the middle and pulled down at the tips. This shape should usually aid roll stability.
Photos: Véronique Burkhardt

What Apco say

The pitch: "Apco's first all-round purpose-built Sports Class reflex wing for a wide segment of pilots ... [The Lift] is not a tuned down version of the Force, but all in all a new wing, purpose built and designed for the specific needs of a wide range of pilots, targeting anyone who would like to fly an easy, rock-solid, reflex wing with excellent performance and speed."
Sizes: Small 26m, Medium 28m, Large 30m
All-up, including paramotor: 75-140kg, 100-165kg, 125-185kg
V-min: 21km/h
V-trim: 36-39km/h
V-trim off: 48-50km/h
V-max: 62km/h
Min sink at optimal wing loading: less than 1.1m/s
Online: *www.apcoaviation.com*

Inflation and launch

On inflation it does what it says in the manual. The wing inflates very quickly and evenly and then sits above the pilot as if it was nailed there. If there is a little wind it is nearly possible for the pilot to leave the wing like that and go for a coffee. In an Apco promotional video a pilot actually does this... after landing on the beach, he loads the brakes a little and then sits down next to the wing and lets it do all the work itself.

When we tested the wing the conditions were not laminar enough to try this, but the wing was definitely extremely stable. The only noticeable characteristic when facing the wing whilst groundhandling in strong wind was the fact that it was a little difficult to make the tips flip over when the wing is lying with the leading edge facing down.

Launch and in the air

Contrary to expectation, the wing was not particularly fast during the launch run – presumably the reflex characteristics become apparent even with closed trimmers. The Lift is extremely stable as soon as the pilot is in the air. This part of the specification is unquestionably fulfilled – in roll and pitch the wing is stable and reassuring. This is a big advantage, especially for new pilots. However, when initiating a turn the roll stability is evident and the canopy shows a little resistance to the turn. A lot of brake input is required and brake pressure is deliberately high.

An additional advantage is found when flying close to the ground. The high roll and pitch stability, paired with good slow-flying characteristics, means the pilot can relax while cruising close to the terrain. Even in turbulent conditions the wing stability is evident, although it appears that the special curvature of the canopy causes the wing to accordion across the span. This happens even with only a little turbulence. But this phenomenon doesn't change the fact that the wing is well behaved and stays where it should – above the pilot's head.

Speed to fly

Like on many Apco wings, maximum speed is achieved by using the speed bar. If trimmers are used additionally we found the wing will reach just over 55km/h, rather than the 62km/h claimed by the company. But for this type of wing this is sufficient. When accelerated, the pilot should use the wing tip brakes rather than the main brakes. During test flights we used the wing tip brakes in combination with the main brakes to improve the turning characteristics when the trimmers were closed. This markedly increased the responsiveness of the wing.

Conclusion

Apco has succeeded in fulfilling its specification and has made a "beginner version" of the Force. Compared with the Force, the pilot has to accept a reduction in agility but that is part of the design. A wing for beginners and for easy flights on long trips.