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WORLDWIDE PARAGLIDING AND PARAMOTORING MAGAZINE. FOR FREE.



#_icare_2018 #trends
(Part_1/2)



NIVIUK.COM > HARNESSES

EN/LTF

KONVERS 2

Live the journey

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facebook.com/Niviuk



instagram.com/Niviukparagliders



The photographer, Bruno Lavit, captured a very symbolic take off: a replica of the first flying machines, under an Advance Pi2, a wing which is at the forefront of modern technology in paraglider manufacturing.

Translation by Ruth Jessop

At the 2018 Coupe Icare, the biggest free flying festival in the world, new technology such as the RAST system took pride of place. Hi-tech for flying with total peace of mind. We also noticed that the single skins, whilst diversifying, have gone fully into another, well established trend: lighter and simpler. This return to basics has also happened in cutting edge technology, such as the use of high-tech modern fabric like Skytex 27. It has been tried and tested for more than a decade now. The next step in light weight, Skytex 21, is expected to feature in the 2019 X-Alps. We visited the textile factory in France.

Not everything which was new at Saint Hilaire is in this issue: we'll publish more in the next issue..

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IN THE NEXT ISSUE

LIGHT, INSTRUMENTS AND OTHER GADGETS

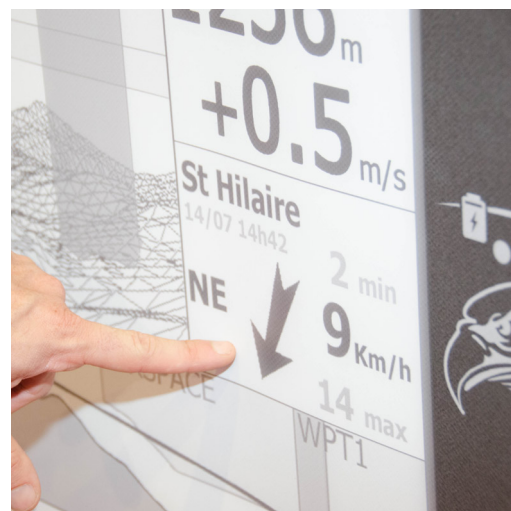
As it was impossible to find room for everything new in this edition which also includes several tests, you will find more in the next edition along with other interesting tests. Here is a short, but not exhaustive list:



U-Turn's range of products from the electric motor to numerous new free flying paraglider wings.



News of trackers: amongst other things, the SPOT has become bidirectional! And also: 3D tracking with Flymaster and FLARM in the XCTracer...



The Syride Sys'Evolution now communicates using Bluetooth, it will therefore offer live tracking and give information about the weather!



BGD: the Riot is a lightweight version of the Punk.



Kortel: a new version of the famous Krüyère, full of interesting innovations.



Information and tests: the new version of the GPS-Bip and a test of the Naviter Hyper...



ADMINISTRATION: Germany
DESIGN: Germany,
MANUFACTURE: Italy

RAST AND AGERA

The RAST system, although already on display at previous Coupe Icares, was clearly in pride of place this time. This invention by Swing's R&D team, led by Michael Nesler, won a Jean Marc Mouligné prize at the Coupe Icare, which rewards flying inventions which are either aesthetic or innovative.

RAST (also see the following pages) has been put in one of Swing's EN C gliders for the first time: the Agera is a 3 line wing, but with behaviour close to that of a two liner. The RAST system gives it a large power range which can be used when flying. Five sizes are anticipated.

www.swing.de

The Swing Agera, the first EN C to be equipped with RAST.

Lars Pongs from Swing explaining the RAST system to an American journalist.





Photo : Philippe Lami

INITIAL TEST SWING NYOS RS

The Nyos RS is an EN B+ wing and part of the range made by the German manufacturer Swing. It is obviously equipped with the RAST system, Swing technology which is now automatically included in all their wings.

By Philippe Lami

The Nyos RS offers, for a flat aspect ratio of 5.7, a wing with 61 cells. The designer, Michael Nesler, on principle, avoids putting a SharkNose on any of their intermediate wings. On the other hand, he reinforces the wings with Nitinol leading edge rods. This Nickel Titanium alloy is known for its memory properties and its light weight. The lines are fluid and sheathed lower down and unsheathed higher up.

Photo : Philippe Lami

The Nyos RS inflates no problem at all, every time. Whether in low wind or strong wind, it's surprisingly easy and docile, and builds up very little energy. The load take up is direct and the initial impression is that you have got your hands on a very manoeuvrable little machine which is very precise whilst providing a lot of brake travel. The wing is fun, playful, compact and very pleasant.

The turn is quick to start and it banks exactly as you want it to. However, you have to pay attention to correctly coordinate the turn without overdoing it and degrading the sink rate too much.

Initially, in little bubbles, the Nyos appeared to be docile, but a bit 'thin' to use weak thermals properly. Undoubtedly, it's in strong conditions that this wing shows its real temperament, by offering excellent pilot comfort, with very little input necessary in the pitch and moderate effort through the controls.



Photo : Philippe Lami

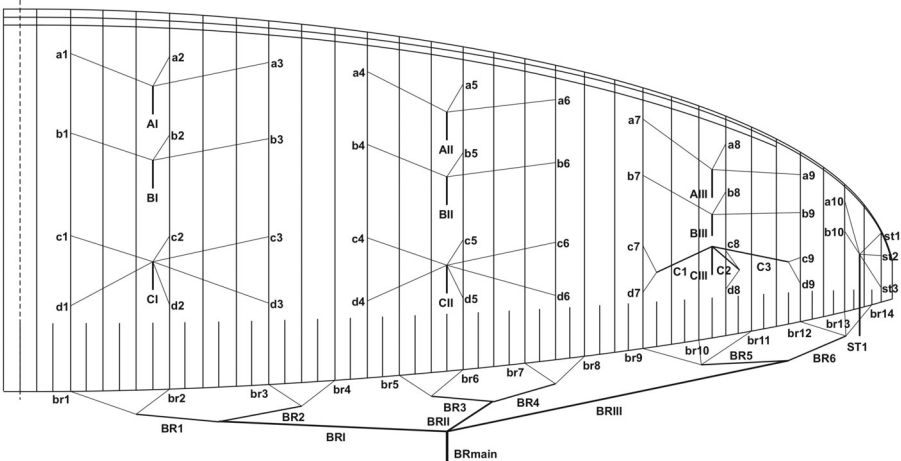


The communication from the wing, from putting the rear of the wing ‘under pressure,’ is really astonishingly clear and it communicates only useful feedback. In its category, as far as comfort goes, it’s first class!

Going up in a thermal, even a strong one, is fun, with gentle controls and a wing which is simple to manage. In fact, it represents, despite its aspect ratio of 5.7 (which you don't feel), a very nice, calm alternative to the other stars of the B+ category such as the Rush 5 or the Iota 2. The wing always remains very homogenous, compact and well behaved.

The wing flies very well when using the rear risers without the brakes, thanks to the strap which links the C risers. Using maximum accelerator, even in rough conditions, the Nyos RS always offers the same amount of comfort and is relaxing to fly when other pilots are obliged to slow down.

It’s a valuable asset which allows an untroubled flight using 100% of the wing. Here, at Saint André les Alpes, a site with a reputation for sometimes very strong conditions, the Swing Nyos seemed like a top of the range 4x4, being both comfortable and obedient.



SWING NYOS RS					
TECHNICAL DATA					
MANUFACTURER SWING					
Web : www.swing.de/nyos-rs-en.html					
DATE	2018	2018	2018	2018	2018
SIZE	XS	S	M	L	XL
CELLS	61-	61	61	61	61
FLAT SURFACE AREA [M²]	22	24.7	27	29.4	31.7
FLAT WINGSPAN [M]	11.2	11.8	12.4	12.9	13.4
FLAT ASPECT RATIO	5.7	5.7	5.7	5.7	5.7
ALL UP WEIGHT [KG]	60-80	75-95	85-109	95-120	110-140
WEIGHT OF THE WING [KG]	4.5	4.7	5.0	5.4	5.7
FREE FLIGHT CERTIFICATION	B	B	B	B	B
FF CERTIFICATION LAB	EAPR 2018	EAPR 2017	EAPR 2017	EAPR 2017	EAPR 2018
PPG CERTIFICATION	-	-	-	-	-
PRICE [€]	4124	4124	4124	4124	4124



STEP
EN-B+



WWW.SUPAIR.COM

DESIGNED
IN ANNECY

“On full bar, even in turbulent conditions, the Nyos RS always gives the same amount of comfort and is relaxing to fly when other pilots have to lift their foot on the accelerator.”

A few tight turns to get down fast. Careful, you go down very fast here, on demand, with a sink rate which can quickly exceed 10 m/s! It comes out spontaneously, but it's hairy, with a big surge if you don't dissipate the energy by progressively bringing it back to the horizontal. The ears are easy, effective and reopen spontaneously.

I really think that this Swing Nyos RS gives a rare compromise between performance, agility and above all, comfort and calmness.

In my opinion it is one of those excellent wings in the EN B+ category, ideal for no holes barred flying across the horizon in all conditions. 🌈

Photo : Profly / Swing





Photo : Sascha Burkhardt

BACK TO SCHOOL SIX MONTHS OF INTENSIVE RAST

By Philippe Lami

Every manufacturer uses their own new acronyms to denote new and innovative technological solutions, or ones that they have adapted from other manufacturers and given their own finishing touches. Here, RAST stands for "Ram Air Section Technology" and is a wall which traverses the wing linking the upper and the lower surface, placed about mid-chord along the whole wing span, and which acts like a valve. In summary, the effect of the RAST system gives a more progressive inflation, without a tendency to overfly, and once flying, it damps the wing, making the rear of the wing more solid thus allowing better damping of collapses, which also aren't as deep along the chord.

We could discuss at length the technical aspects or even placebos of this innovation. Instead, I am going to talk about the feedback from more than six months of intensive school use of the Swing Mito and Arcus RS (at Aérogliss in Saint André les Alpes, in the Alps in the south of France) and my tests of the Nyos RS and the tandem Twin RS, which both have RAST.

“One thing that all the instructors in our team agreed on was that the RAST is, for instructors, an innovation which gives an advantage over wings made by other manufacturers who don't use it.”

In 2016, Voler.info/Free.aero Magazine tested the Swing Mito being the first to use RAST technology. It was a very pleasant surprise in the EN A category! Since then, the system has been further improved. en.free.aero/contentsHTML/Season2016/?page=71



One thing that all the instructors in our team agreed on was that the RAST is, for instructors, an innovation which gives an advantage over wings made by other manufacturers who don't use it. Our observations were repeated during dozens of flights.

- In nil wind and sometimes even with a back wind (which happens sometimes), inflations are incredibly homogenous, light and compact.
- In strong wind, the wings have a natural tendency to damp, which has the effect of slowing and 'reflexing' the trailing edge. Control of the wing has been, to a large extent, simplified. There is maximum tolerance on the pitch axes!
- In the air, and in particular at low speeds, the RAST System also slows down stalls, which happen a lot later than on a classic wing. On a Mito, it's great to see how the wing becomes tolerant to slowing down even with hands very low!
- The feeling of piloting due to the very real pressurisation of the rear of the wing, has been improved!
- In addition, the rare collapses that occur are, in general, not as deep and are easy to counter.

Clearly all our team of instructors were won over by the system, convinced by the validity of this technology's contribution and the real comfort it brings, both for the pilot and the instructor! Our advice to the wing designers: make several prototypes using the same principle with your current school wings, and we'll talk again when it's back to school in 2019. For me, Swing have here a good and real innovation in terms of safety and comfort!

PS I have no financial interest in the brand, and our school sells lots of other makes.

Philippe Lami



OUR TEST PILOT PHILIPPE LAMI

Philippe has worked with Aerogliss paragliding school for thirty years. He is also one of the most experienced test pilots and specialist paragliding journalists. Another string to his bow is his company Windsriders, who make down jackets optimised for our sport.

Photo: Véronique Burkhardt



In 2018, Voler.info/Free.aero Magazine published a test of the Arcus RS/Arcus RS Lite. One observation, amongst others: it's a standard, go everywhere wing which is very reassuring.

<http://www.free.aero/contents/EN/instruments2018/index.html#issue/68>



SWING ARCUS RS & RS LITE

Durant les derniers mois, Philippe Lami a régulièrement volé avec la Swing Arcus RS, dans ses 2 versions : classique et légère. Il la également utilisée en école. Voici un premier bilan.

Photo: Vol / Philippe Lami



World of XC paragliding

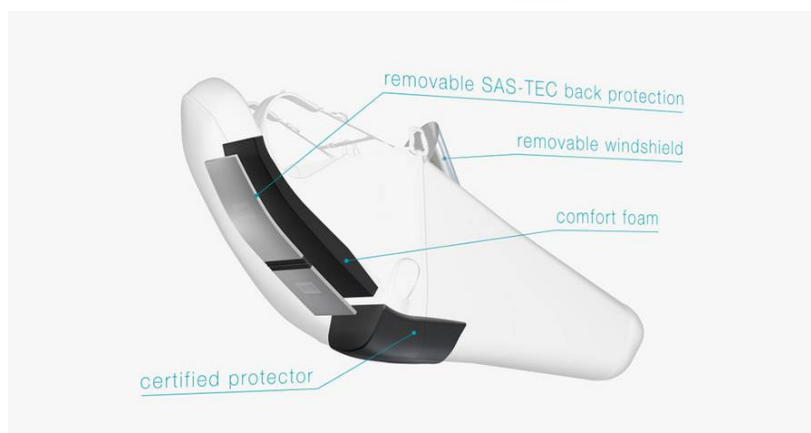
ADVANCE

ADMINISTRATION: Switzerland
DESIGN: Switzerland
MANUFACTURE: Vietnam

LIGHTNESS 3

More comfortable and safer: the new Lightness 3 from Advance is equipped with, in addition to certified protection under the seat, an SAS-TEC anti piercing back protection, which has been added behind the foam back. To save weight, you can also remove it, and choose a very light cocoon, bringing the total weight down to only 2.75 kg. With all the options it comes to 3.37 kg...

<https://www.advance.ch/en/products/harnesses/lightness-3/>



Not just a fashion, but really useful, an optional wind deflector.



Photos : Sascha Burkhardt

DON'T GIVE UP THE DREAM



"I started in free flying 40 years ago and soon got into competitions. After some time, friends started asking me to make their wings. So I decided to do it. And I've never looked back. Designing, testing, manufacturing, competing, travelling, laughing and crying – it's my life."

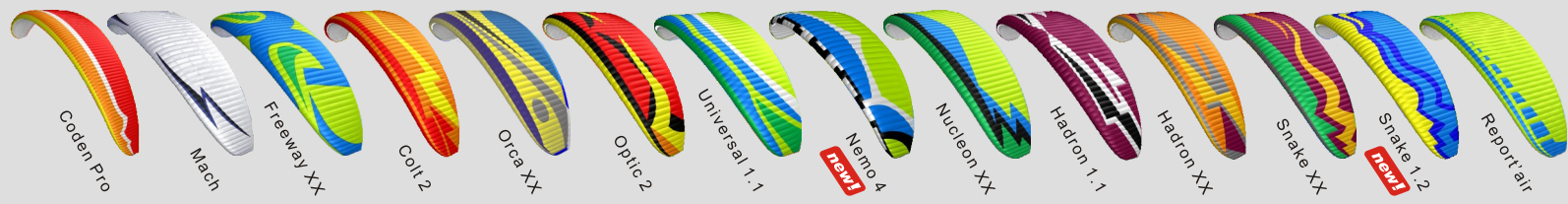
– Gin Seok Song, Gin Gliders



G I N

www.gingliders.com

DUDEK full range of freeflying & paramotor wings

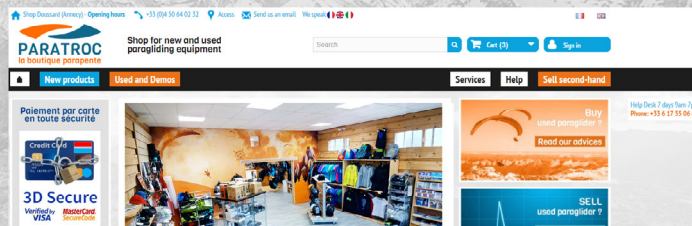


www.dudek.eu

One of the largest fancy dress costumes. It wasn't easy to handle the vast amount of drag...



Photo: Bruno Lavit



...in addition, the pilot landed exactly on the target!



Photo : Johan Chemin



MASALA

lightweight allrounder

LTF09: A | EN: A

*This glider expands
my horizons -
The MASALA 3 turns every summit
into a launch site!*

*Christin Kirst
Hike & Fly Expert
Skywalk Team Pilot*



PURE PASSION FOR FLYING



skywalk.paragliders



skywalkparagliders

www.skywalk.info

SKYWALK

NEO



ADMINISTRATION: France

DESIGN: France

MANUFACTURE: France

NEO GETS YOUNGER

The BabyDoll is Neo's first harness for children. It comes in three sizes, covering ages 3 to 13 years.

It weighs between 0.9 kg and 1.3 kg.

It's a real little harness for paragliding, whether for going tandem, ground handling or flying solo.

It has been optimised to make it easier to get the child automatically into the sitting position. A large part of the development was carried out by youngster Mélyne Marouf.

The harness is equipped with back protection, is EN and CE certified, and is made entirely in France.

In our next issue which will be more focused towards 'Light', we will review other innovations from Neo.

<http://www.flyneo.com/en/>

WHO'S WHO?

Mélyne Marouf
from Neo with
her creation.



Photo : Sascha Burkhardt

VIDEO: GROUND SKIMMING



Impressive: Daniel Kofler shows, with great dexterity, the possibilities for skimming the ground on a Swing Mirage RS 9.5.

GROUND SKIMMING

At first glance, it looks fake, but this sequence really was filmed with a Fusion GoPro. To keep things simple, they used two Hero 5 Black cameras equipped with fish-eyes and mounted back to back. Their field of vision therefore lets them cover a full sphere and then to electronically erase the boom fixed onto the pilot's back. On the other hand, as it is two films which are being processed at the same time, it needs a powerful configuration and lots of time for the processing of the film.

Daniel's flying technique is impressive; he's obviously a speedflying pro. He's flying between 50 and over 100 km/h. The most dangerous manoeuvres are, of course, the barrel rolls, but even when flying straight, any contact with the ground would be very painful. Daniel said he chose summer ski pistes for their relatively soft, grassy slopes. We wanted to know the secret behind this

ground skimming flight. Daniel Kofler: The Mirage RS has a very large range of accessible speeds, not just using the trims, but also using the brakes and the rear risers. It transforms every action very precisely and very intuitively. It also offers lots of safety. Obviously, you have to choose a good line, so that you can play with the ground, both on a horizontal and vertical plane.

Daniel is working mainly with the brakes here, skilfully transforming speed into height, but only just enough to ensure that he doesn't touch the ground.

The Mirage RS has a SharkNose, and most importantly, the RAST system which gives it, according to the designers, increased safety during take off and whilst flying, as well as stability during turbulence. A big advantage, especially when skimming the ground.



The GoPro Fusion (630 €): a lens on either side for spherical filming, amongst other things. An interesting detail: the 360° technology has been developed by the French company Kolor, which was bought by the American company GoPro precisely for their 360° photographic/video know-how. Soon we'll bring you a more detailed review of the new range of GoPros, including the Hero 7. We worked a lot with the GoPro Hero 6, which was already a big leap forward compared to previous models. The Hero 7 Black (430 €) is the recent top of the range GoPro: www.gopro.com



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LTF/EN A



PARAGLIDERS



HARNESSES



RESERVES



ACCESSORIES

FLYDOO

ADMINISTRATION: France
DESIGN: France
MANUFACTURE: France,
Sri Lanka

THE ELECTRICALLY OPERATED POCKET BALLOON

The other Jean-Marc Mouligné 2018 prize went to Flydoo. An ultralight balloon packed with innovations from the basket to the burner. Made from Porcher Skytex 38g/m2 fabric and with everything from optimised valves to 3D-Shaping, winglets high up and brushless 10 kW electric directional propulsion. This lets you choose the landing field. It's light and can be towed by a bicycle...
www.flydoo.fun

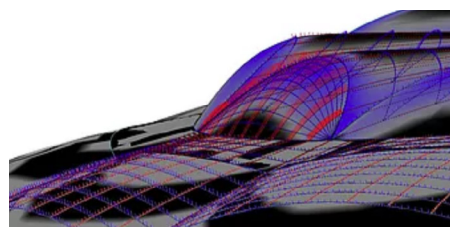


Photo s: Flydoo



WHO'S WHO?

From left to right:
 Marion Varner, member of the FFVL international commission, Bernard Jordan, the FSVL representative from the French speaking part of the Switzerland, Charlie Jöst, President of the DHV, Véronique Gensac, President of the FFVL, Robin Frieß, Chief Executive Officer of the DHV, Yves Goueslain, National Technical Director of the FFVL, Hannes Weininger, Director of the technical department of the DHV.

FFVL-DHV-FSVL 

MEETINGS

The European Federations are talking to each other more than ever before. This is important particularly for the FFVL and the DHV, the two largest federations in the World, as the president of the FFVL, Véronique Gensac, explained. This sort of informal meeting precedes more formal meetings (CIVL and WG6 for example).

At the Coupe Icare, the Federations discussed an interesting ecological subject: collaboration to organise recycling of old paragliders which are shredded and end up in harness seat boards.

This is technically possible, but whether it can be done from a logistical point of view remains to be seen.

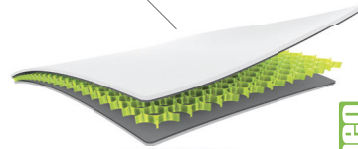


string cover leg



WEIGHT: 715 g

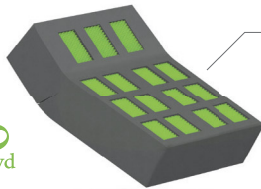
SANDWICH: TEXTILE LAMINATION



stay up

WEIGHT: 1.45 kg

PROTECTION: NEO Koroyd 2.0



suspender

WEIGHT: 3.85 kg

PROTECTION: NEO Koroyd 1.0

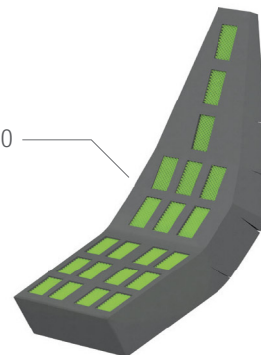


Photo : Karen Skinner



[Link 2](#)

NIVIUK



ADMINISTRATION: Southern catalonia
DESIGN: Catalonia, Swiss
MANUFACTURE: Vietnam, China

NIVIUK

Niviuk hope to get back into competitions with the IcePeak Evox. The Artik 5 and the tandem Takoo 4 have been a real hit this season.

Finally available: the Link 2, an accessible wing for beginners but also one which will go far in the intermediate market with a maximum speed of 55 km/h thanks to, amongst other things, its reflex profile. Its very good stability comes from the use of lots of modern technology, including orientation of fabric to counter stress.

Niviuk also offer lots of new harnesses which we will review in detail in a future edition.

All new: the Watson, a reversible tandem harness, with increased comfort and a preinflated airbag thanks to Nitinol wires.



Niviuk had, once again, one of the biggest teams at Saint Hilaire. Far right, above: the French dealer, Michael Georges.

WHO'S WHO?

Photos : Sascha Burkhardt

Dominique Cizeau, the founder of Niviuk, with a representative from the Germanic nations, Mario Mittermaier. Countries where Niviuk is increasing in popularity...



Photo : Sascha Burkhardt





NIVIUK LINK 2

LINK 2 TECHNICAL DATA			
MANUFACTURER : NIVIUK			
Web : http://niviuk.com/fr/paramoteur/link2/			
DATE	2018	2018	2018
SIZE	21	23	25
CELLS	55	55	55
FLAT SURFACE AREA [m²]	21	23	25.5
FLAT WINGSPAN [m²]	nc	nc	nc
FLAT ASPECT RATIO	5.1	5.1	5.1
ALL UP WEIGHT [kg]	55-110	70-120	90-145
FREE FLIGHT CERTIFICATION	DGAC	DGAC	DGAC
WEIGHT OF THE WING [kg]	4.8	5.1	5.5

Photos : Niviuk



SKYTRAXX



WITHOUT COMPROMISE

www.skytraxx.eu info@skytraxx.eu

© 2007 SKYTRAXX

A first: the Patrouille de France at the Coupe Icare 2018



SINGLE SKIN EVOLUTION

HYBRIDE

Apco was the first manufacturer to launch a single surface which was part double surface, therefore making it a 'hybrid.' The idea was to increase the into wind penetration of the wing and to also make it more incisive when entering thermals.

Many current single skins certainly already have pretty high performance and are sometimes even at the top of the gaggle in weak conditions (the Niviuk Skin 2 single and tandem, the Skyman Sir Edmund Race for example), but they slow down when entering a strong thermal.

A rigidification and optimisation of the front part of the wing and of the leading edge could be the solution. Indeed, these wings are faster, and they penetrate the air mass better.

Obviously, as there is more fabric, you lose part of the weight advantage. You therefore have to find the best compromise.

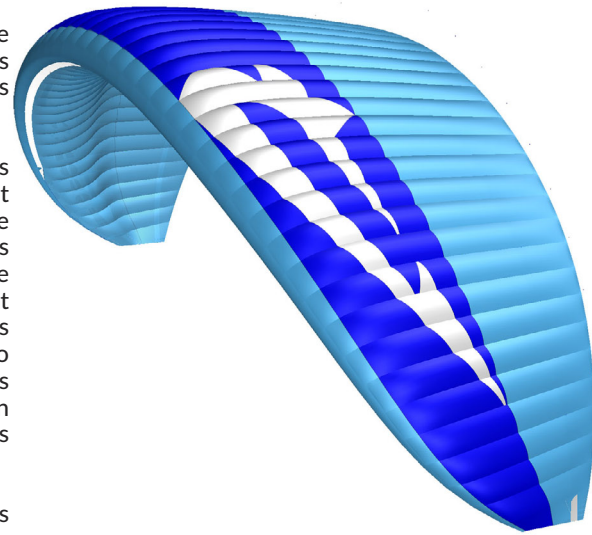
Apco have chosen to double the first third, other manufacturers (Ozone XXlite 2, Dudek Run&Fly) have limited this just to the leading edge. Dudek have even succeeded in remaining under one kilo, despite the double skin.

Alain Zoller from the testing house Air Turquoise at the Coupe Icare: 'yes, the hybrids that we have tested all have typically nice behaviour like the other single skins.'

Interesting developments which we are following whilst testing all the innovations (see the pretest of the Apco Hybrid in this edition).

Of course, we are also interested in its behaviour outwith normal flight. One might worry that there would be a type of 'inverse RAST' effect, with these sorts of sausages along the leading edge. Remember the unrecoverable collapses on the LdK Trilair at the time... For the moment, our worst fears haven't been realised, as Alain Zoller also confirmed for us. The single skins remain, as a general rule, some of the safest wings, even if sometimes the certification can't take this into account and certifies them as C or D.

Important: naturally pilots ask questions about the solidity of single surface wings, because the wing is made from only one layer of fabric. The answer is reassuring: it is largely compensated for by the number of attachment points and by having a far greater number of lines than on a normal paraglider. It is also interesting to remember that thanks to their very lofty profiles, the single skins are all smaller than classic wings. A very good example: the Niviuk Bi Skin 2 P is only 31 m² for an all up weight of 190 kg, and manages, nonetheless, to be superior to other tandems, especially in weak or medium thermals.



The Apco Hybrid was the first hybrid on the market.

Between the single skin and the hybrid: the Ozone XXlite2 is only classified EN D because of the use of folding lines.



Photo : Véronique Burkhardt



XXLite2

Higher trim speed | Accelerator system | Excellent flare & landing behavior
Improved comfort in-flight | More compact and agile handling

THE WORLDS LIGHTEST AIRCRAFT:
XXLite2 + B*Lite rucksack + F*Lite harness = 1.5 kg

The XXLite 2 is a single-surface ultra-lightweight mountain wing designed for serious Hike & Fly pilots and alpinists. This all-new design delivers significantly improved performance and handling with a higher trim speed and easier landing, compared to its predecessor.

WWW.FLYOZONE.COM

Pilots: Honorin Hamard Photo: Luc Armant Location: France



APCO



ADMINISTRATION: Israel
DESIGN: Israel
MANUFACTURE: Israel

This isn't a minimalist wing. 3.1 kg is, on the other hand entirely correct given the double surface as well as the number of rods and reinforcements. The trailing edge is, moreover, pretty taut.

FIRST TEST

APCO HYBRID: AMAZING

Apco, one of the pioneers of new technology used in paragliding, brought out their hybrid in the spring of 2018, a single skin with a double leading edge, made from Porcher Skytex 32 and 27.

The EN B wing (very close to EN A) is aimed at beginners, intermediate pilots and walkers...

The hybrid concept compensates for the typical faults in single skins. We have started to test the size 22 model.

First observation, the construction is fairly complex, integrating rods even in the back part of the wing. Therefore, its weight isn't going to be revolutionary: 3.1 kg in this size. Looked at from this angle, you would therefore doubt the soundness of the concept... The volume when folded, on the other hand, remains fairly small.

However, it is, above all, the behaviour in flight which interests Apco. And there, it has to be said, this wing is amazing. During take-off, it is a typical single skin: it comes up all by itself and is comparable to an 'open' single skin. It positions itself very nicely above the pilot.

The load take-up is better than on a classic single skin, a positive point which will be useful on a paramotor too!

The best of both worlds?

Photo : Apco



Apco promise lots of stability in pitch as well as in roll, thanks to, amongst other things, a reflex effect in the profile. The stability is indeed amazing. In addition, this wing doesn't have any of the small jerky movements of a classic single skin.

The wing is fairly incisive when entering a thermal, whilst nicely keeping the same pitch. Conforming to their promises, the very little effort required through the controls, makes it very comfortable and efficient to fly, despite being very roll stable, which is, in part, due to the walls not having a lower surface. However, this stability doesn't prevent you doing nice wingovers if you can find the right rhythm. Using thermals is, in any case, very easy and safe, including in turbulence.

It really is a paraglider for carefree thermaling. Coming out of thermals, there is never any significant pitch forward.

Only its maximum speed prevents it from being used to fly significant distances. The figures point to 47 km/h; we stayed at about 5 km/h less than that, measurements which we will need to confirm.

But in any case, it goes forward much better into wind and in gusts than classic single skins, which often have difficulty penetrating.

So, the first impressions were very good, even surprising. A very flexible wing, one to keep an eye on...

By Sascha Burkhardt



The lines are sewn inside the cells



A complex leading edge.



Reinforcements at the back. There are rods elsewhere too.



Lots of anchor points.

APCO HYBRID TECHNICAL DATA			
MANUFACTURER : APCO			
Web : https://www.apcoaviation.com/hybrid_pg/			
DATE	2018	2018	2018
SIZE	S	M	L
CELLS	48	48	48
FLAT SURFACE AREA [m²]	20	22	24
FLAT WINGSPAN [m²]	10.1	10.6	11.0
FLAT ASPECT RATIO	5.1	5.1	5.1
ALL UP WEIGHT [kg]	55-75	70-90	85-105
PTV MOTEUR [kg]	70-95	85-110	100-125
WEIGHT OF THE WING [kg]	3.0	3.1	3.2
FREE FLIGHT CERTIFICATION	EN B	EN B	EN B
FF CERTIFICATION LAB	AIR TRQ.	AIR TRQ.	AIR TRQ.
PPG CERTIFICATION	DGAC*	DGAC*	DGAC*

Materials: * in progress
 Porcher Skytex 38, Skytex 27



Photo : Apco

The factory in Israel: 3,200 m².

APCO



ADMINISTRATION: Israël
CONCEPTION: Israël
FABRICATION: Israël

INNOVATIONS FROM ISRAEL

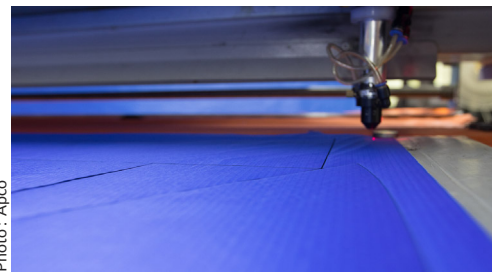
Apco has been active in free flying since 1982 and they made their first paraglider in 1986. Apco has brought numerous innovations to our sport. They were the first manufacturer to integrate rods into production wings for example...

Apco make both paramotor and paraglider wings.

Manufacturing and design take place in the same location.



Photo : Apco



Gliderbase

Paraglider search and comparison



The Run & Fly 16 m²: less than a kilo!

DUDEK



ADMINISTRATION: Poland
DESIGN: France, Poland
MANUFACTURE: Poland

DUDEK RUN&FLY : 986 GRAMMES

Dudek have been working on single skins for a while now. The developers have gained a lot of experience by making these wings for use with model aircraft.

At the Coupe Icare Dudek launched the Run&Fly. It is no longer a case of 'hike&fly,' but rather 'run&fly,' as this wing weighs virtually nothing: 986g, with a volume of 4 litres despite a sausage shaped, totally closed leading edge and with integrated leading-edge rods to form a SharkNose. The main profile only needs little rods as the internal pressure in the small sausage is very good.

The wing was made in collaboration with Porcher Sport. It was almost entirely developed by Jean-Baptiste Chandelier, who believes strongly in the future of single skins as a separate category.

This freestyle and acro specialist, nonetheless, has not tested this type of manoeuvre on the Run&Fly. According to JBC, it certainly has a short line cone and is very manoeuvrable, but the pitch and roll stability is very substantial above a certain angle.

These are qualities typical of a nice, single skin, and make it very safe. The Run&Fly, on the other hand, won't be certified. In a 16 it would have As for everything, JBC told us, except for exiting a stall where its score would drop to a C.

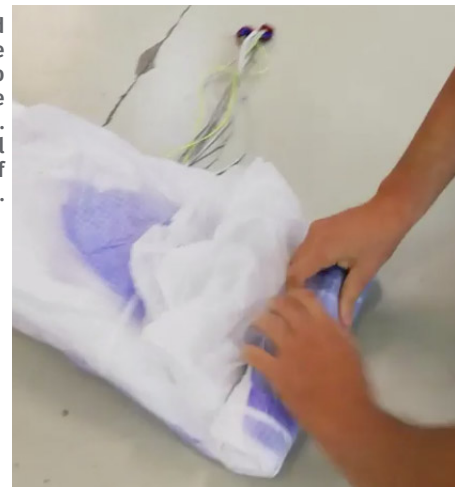


Dudek's promotional video. The price should be 2 000 €.

With the fairly specialized folding technique recommended, you need to both fold and roll the fabric at the same time. The result: a very small bundle with a volume of four litres...

But that is no reflection on the safety of this wing which, once again according to JBC, would never dive far enough for you to fall into it, in contrast to some EN A wings where that can happen.

The glide ratio of the wing is around 7. It is expected to be in four sizes: 14, 16, 18 and 20. Note that a single skin wing of 16m² is about equivalent to one of 19 or 20m².





SKYWALK



ADMINISTRATION: Germany
DESIGN: Germany
MANUFACTURE: Thaïlande

LIGHTER STILL

Skywalk, whom we'll no doubt be talking a lot about in 2019 during the X-Alps, are offering more and more very lightweight products.

We have tested the excellent Range X-Alps in its second version with an inflatable back protector: more information about that in the next issue!

The Arak has been available from mid-October onwards.

Due to its moderate aspect ratio and its totally sheathed lines, the Arak shares the simplicity of the Tequila, but it is equipped with a higher performance profile, similar to the Chili. Made from 32 g fabric and 38 on the leading edge, the Arak is a relatively lightweight wing, designed for hike&fly (4.5 kg in M), whilst at the same time, being fairly robust.

www.skywalk.org

The profiled harness, the Range X-Alps, only weighs between 1.7 and 1.9 kg.

Full of interesting details such as the practical inflatable protector which makes it safe and comfortable.

There will be a test in the next issue.



Promotional video of the Arak: an EN B certified lightweight wing, with good performance and which follows the current trends.





Photos: Independence



ADMINISTRATION: Sri Lanka
DESIGN: Sri Lanka
MANUFACTURE: Sri Lanka

SKYSPORTS

This is the oldest paraglider manufacturing factory in Sri Lanka. Wings for Independence, Skyman and MacPara are made here, for example. Interestingly enough, the final control has been pretty ingeniously organised using a typical inflation station before the lines are added, but also using a blower which allows the wing to be checked hanging upside down.

Right: inflation before the lines are added, below, the final control with a blower.

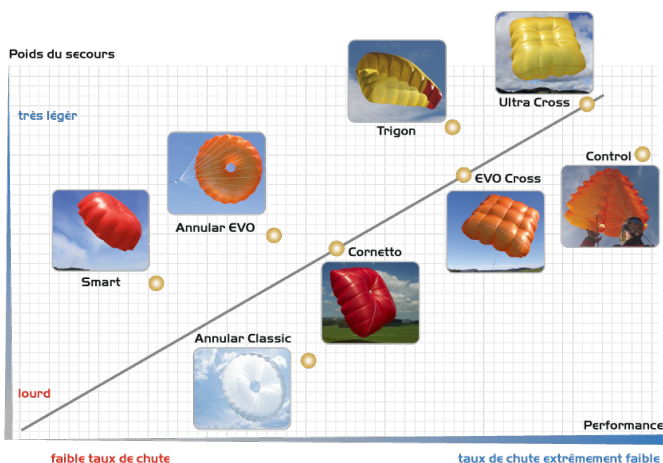




Stefan Kurrle (Independence, Skyman) and on the right, his brother Uli Kurrle, owner of SkySports.

WHO'S WHO?

For the numerous models of reserve in the range, Independence have worked for a long time with calendered fabrics, D10 and D20 for reserves, this avoids problems with porosity after a water landing. In addition, Stefan Kurrle, who has been a parachute specialist for twenty-five years, was the first to inform us about the problem with cheap reserves.



Essential work which has to be done by hand: melting the threads which exit from the stitching



After every stage in the sewing procedure...



a quality control.





INDEPENDENCE

ADMINISTRATION: Germany
DESIGN: All, Austr., Sri Lanka
MANUFACTURE: Sri Lanka

GRASSHOPPER

One of Independence's single skins is the Grasshopper, the first EN A single skin. We tested it extensively this summer, and also let a beginner use it for part of their training. In addition, we interviewed a school in Germany who used it for several months for training. They noted: it isn't just perfectly suited to beginners, but it also has better performance than you would think. A student with twenty-five flights under his belt managed to outclimb normal wings in a weak thermal... The full details will be in the next edition!

GRASSHOPPER				
MANUFACTURER : INDEPENDENCE - WEB www.independence.aero/en/products/paragliders/grasshopper-LTF-EN_A.html				
DATE	2018	2018	2018	2018
SIZE	XS 22	S 24	M 26	L 28
CELLS	35	35	35	35
FLAT SURFACE AREA [M²]	22	24	26	28
FLAT WINGSPAN [M²]	10.16	10.62	11.05	11.47
FLAT ASPECT RATIO	4.7	4.7	4.7	4.7
ALL UP WEIGHT [KG]	60-80	70-90	80-100	90-110
WEIGHT OF THE WING [KG]	3.1	3.25	3.4	3.55
FREE FLIGHT CERTIFICATION	LTF/EN-A	LTF/EN-A	LTF/EN-A	LTF/EN-A
FF CERTIFICATION LAB	EAPR	EAPR	EAPR	EAPR

Materials: Domenico 20D



WHO'S WHO?

Next to Stefan Kurrle: Anupe Isurujith, the main designer at Skyman. The Grasshopper, on the other hand, was mostly designed by Markus Gründhammer from Skyman (see next page).



This isn't the first time that we have published photos taken by Skyman's Markus Gründhammer, but we never tire of this romantic flying photographer. His latest post on Facebook, a self-portrait with his Skyblade, with an aspect ratio of 13.56!

WHO'S WHO?

His message:

'The saddest thing is when you take away an angel's wings.
When I was a little boy, they took away everything I had.
I got myself some wings and now I can go where I want, when I want...'



Photo s: Markus Gründhammer



SKYMAN



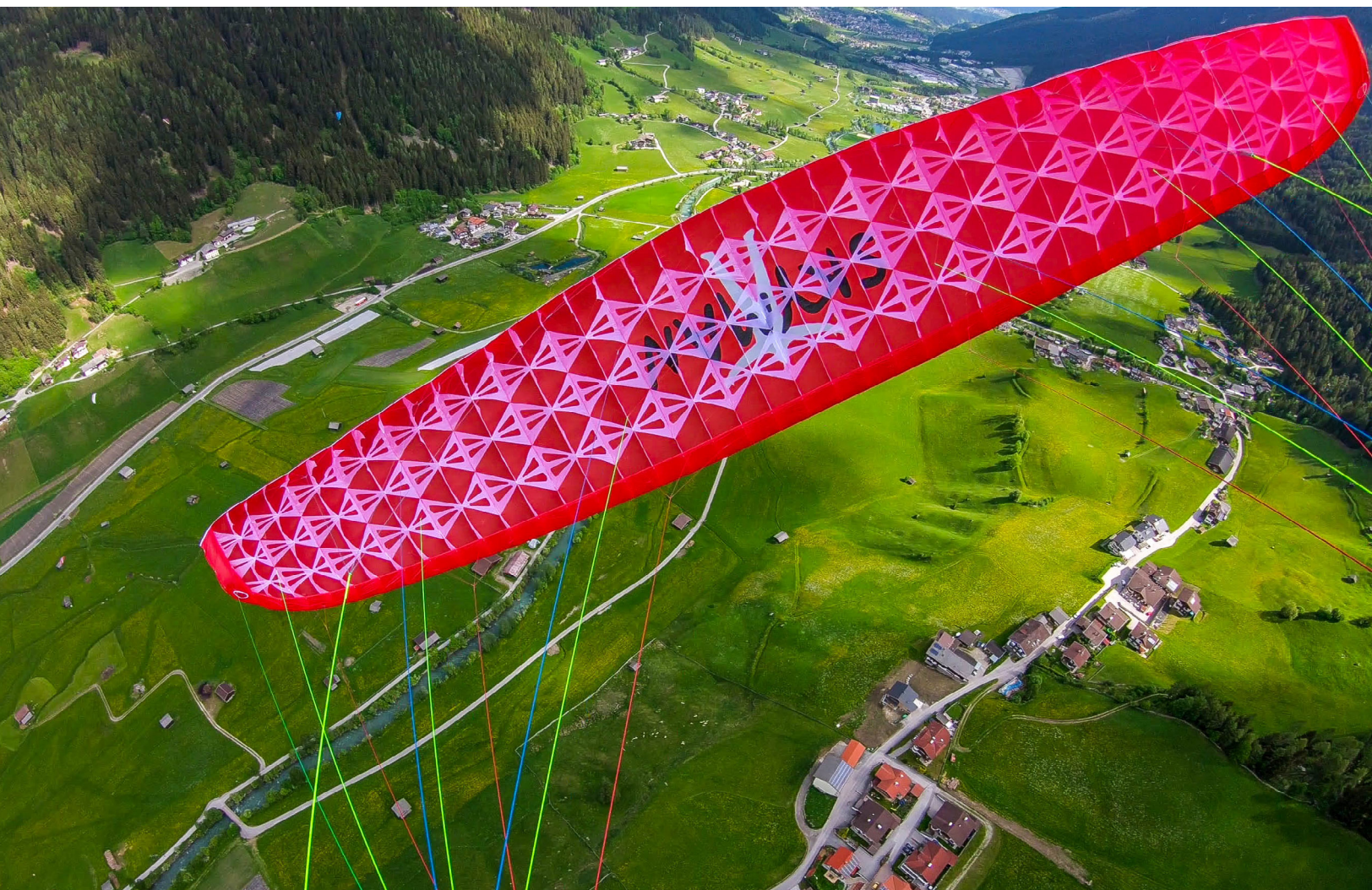
ADMINISTRATION: Germany
DESIGN: Germ., Austr., Sri Lanka
MANUFACTURE: Sri Lanka

SIR EDMUND RACE

Skyman's Sir Edmund Race, which has been available since the summer of 2018, has started to prove itself and has shown that a single skin really can be a performance paraglider (with an aspect ratio of 6, it is, nonetheless, an EN B). Markus Gründhammer's latest baby has also been put through its paces by our test pilots: look out for the verdict in our next issue.



Photo : Véronique Burkhardt





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Hike & Fly
Speed Glider

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MAC PARA
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Funicular of St Hilaire

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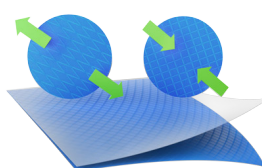
LIVE IT !

Création : avec1e - copyright Jean-Baptiste Chandelier

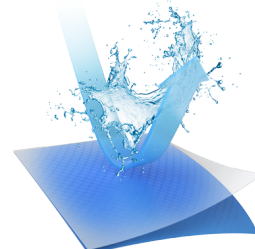
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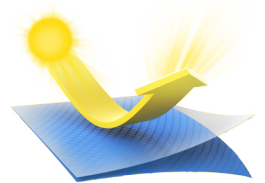
www.porcher-sport.com



Low deformation



Low moisture pick up



UV resistance

OZONE



ADMINISTRATION: Grande Bretagne
DESIGN: France
MANUFACTURE: Vietnam

EVEN LIGHTER

The long awaited XXLite 2 has finally been launched. See the following page.

The lightweight tandem, the Wisp 38, was launched back in the spring. It's a wing based on the Jomo, which itself was a lightweight version of the Mojo.

The professional tandem, the Magnum 3 and the paramotor wing, the Roadster 3, were certified in September.

WHO'S WHO?

The developers at Ozone (almost all the team are shown here): Russel Odgen, David Dagault, Fred Pieri, Luc Armant and Honorin Hamard.

Photo : Sascha Burkhardt



The all new Mantra 7 will be out soon.



Photo : Sascha Burkhardt



The Wisp 38 being tested at Voler.info/Free.aero (to be published in the next edition). One of our testers, Estéban Bourouffiès, wrote:
'A lightweight wing with the same advantages and performance as a classic tandem.'

XXLITE 2 BY OZONE

THE MINIMUM

The XXLite 2 was designed to be pretty much the same weight as the version 1, because ‘if it is heavier, there is no point in having a single skin as we already have the Ultralite 4....,’ the designers explained before it was launched.

They have clearly succeeded: between 1.3 and 1.4 kg. Combined with an F-Lite harness, this gives an aircraft weighing 1.5 kg...

The leading edge is equipped with a small amount of lower surface, which forms a tube, closed at the back. It is therefore a lot less ‘hybrid’ than other wings of this type (Apco, Dudek).

The wing is an EN D only because it needed folding lines for the certification test, otherwise it would be fully A and B, with the exception of a C when coming out of a stall.

Compared with the first version, the XXLite 2 promises greater speed, more comfort and confidence in flight, and is much easier to land.

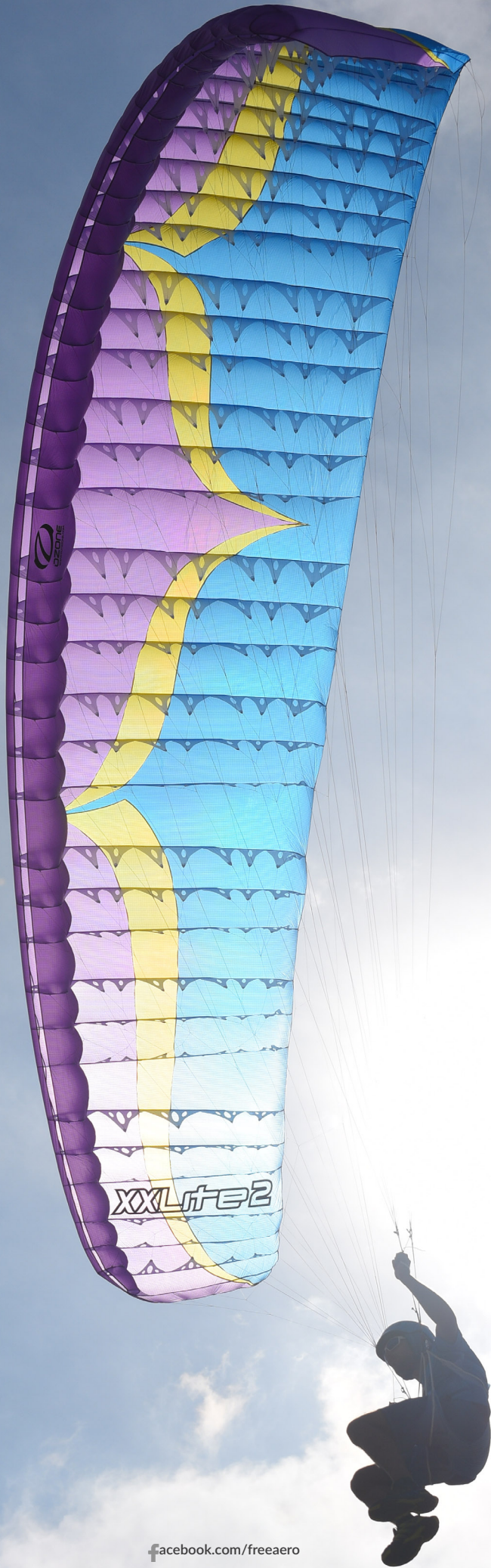
We’ll soon have an example to test.

XXLITE 2 TECHNICAL DATA		
MANUFACTURER: OZONE flyozone.com/paragliders/en/products/gliders/xxlite-2/info/		
DATE	2018	2018
SIZE	16	18
CELLS	39	39
FLAT SURFACE AREA [M²]	16	18
FLAT WINGSPAN [M²]	9.5	10.1
FLAT ASPECT RATIO	5.6	5.6
ALL UP WEIGHT [KG]	55-90	67-105
WEIGHT OF THE WING [KG]	1.3	1.4
FREE FLIGHT CERTIFICATION	EN/LTF D	EN/LTF D
FF CERTIFICATION LAB	AIRTURQ.	AIRTURQ.
PRICE [€]	2600	2680

Materials:

Top surface Porcher 7000 E71A

Bottom surface Porcher 7000 E29



QUICK TEST.

OZONE RUSH 5

The Ozone Rush 5 is a good example of a modern EN B+, it integrates the most recent technology with aspects of the Enzo 3 and the Zeno. A quick test and a potted version of our first impressions...

Test pilot: Philippe Lami

The Ozone Rush 5 brings together Ozone know-how, integrating a simplified SharkNose, very nice 3D-Shaping, and above all, very thin lines reduced to the minimum. A high performance EN B wing, it is aimed at the top end of the market in its classification, rivalling the Advance Iota 2, the Skywalk Chili 4 and the Gin Explorer range.

PREPARATION AND INFLATION

Exemplary finish and lines which need attention when laying out. The inflation is 'calm' and it comes up slowly as it fills very progressively. In strong or windy conditions, the inflation of the Rush 5 turned out to be easy, and it gathered very little energy. In nil wind, it had to be helped, even forced a little, for a successful inflation.

IN THE AIR

Its performance and general homogeneity are obvious as soon as you take off. The wing is on rails, the controls are firm, but not excessive. The response through the controls is immediate and, with a little brake travel, it is very precise. The wing gathers speed immediately, as soon as you release the controls after deep braking. However, the wing is monoblock and very stable and docile on the pitch axis. It has more than 60 cm of brake travel which can be used across the full speed range.

Photo : Nicolas Assaël



With your 'hands low down,' it demonstrates excellent behaviour at low speeds for top landing. Stalls can generally be anticipated and start from the wing tip. In radical configurations, outwith the flyable zone, such as spins or stalls, the Rush 5 is academic, docile, and easy to get back on the rails, making it pretty accessible for its 'B+' category.

The performance is amazing, very close to the Ozone Delta 3, its big sister (at least with hands up). The accelerator is hard under foot, therefore physical to initiate, but very efficient. The ears go in easily, but consequently require help to reopen them quickly.

Photos : Véronique Burkhardt



The risers are relatively simple and light.



The turn is amazing, easy to start, easy to understand and adjust to the desired bank. When thermaling, the Rush 5 has formidable precision and seemed to me to be like some sort of amazing Swiss Army penknife, it can do absolutely anything; you can try whatever you want.

Landing is a pure formality, with a substantial flare.

We will continue our tests, but if these first impressions are anything to go by, the Rush 5 is a very exciting wing, and just as seductive as the Advance Iota 2, with a more marked impression of having something solid above you.

Amazing!

Photo : Véronique Burkhardt



POSITIVE POINTS

- Overall performance
- Performance
- Accessibility
- Solidity

NEGATIVE POINTS

- In nil wind, the wing inflates slowly
- No swivels on the brakes
- Reopening of the ears.

RUSH 5

TECHNICAL DATA

MANUFACTURER : **OZONE**

Web : <https://flyozone.com/paragliders/en/products/gliders/rush-5/info/>

	2018	2018	2018	2018	2018	2018
DATE	2018	2018	2018	2018	2018	2018
SIZE	XS	S	MS	ML	L	XL
CELLS	57	57	57	57	57	57
FLAT SURFACE AREA [M²]	21.41	23.86	25.16	26.5	28.06	30.81
FLAT WINGSPAN [M²]	10.9	11.51	11.81	12.13	12.48	13.08
FLAT ASPECT RATIO	5.55	5.55	5.55	5.55	5.55	5.55
ALL UP WEIGHT [KG]	60-70	70-84	82-94	90-104	100-114	112-128
WEIGHT OF THE WING [KG]	4.63	5	5.19	5.47	5.71	6.2
FREE FLIGHT CERTIFICATION	EN B	EN B	EN B	EN B	EN B	EN B
FF CERTIFICATION LAB	AIR TURQ.	AIR TURQ.	AIR TURQ.	AIR TURQ.	AIR TURQ.	AIR TURQ.
PRICE [€]	4110	4110	4110	4110	4110	4110

Certified by Air Turquoise between March and May 2018

Materials:

Top surface: Dominico 30D MF

Bottom surface: Dominico 30D MF

The new Roadster 3 is a 'very flexible wing, for short flights as well as XC adventures or playing near the ground.' As well as being certified for with a motor, the wing is also certified EN B.

Photo: Ozone



Paramotors



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PARAMOTORS

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Accessories



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ADVANCE IOTA²

Picture: Felix Wolk | Location: Oman

Fantastic sights at the
Coupe Icare 2018

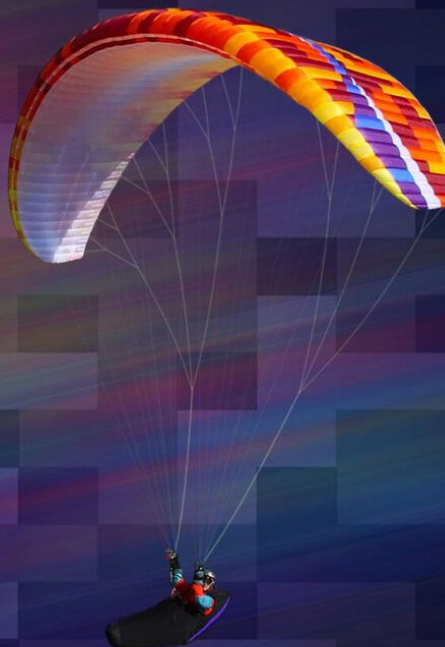


Photo: Alain Douce

Punk^{EN-B}

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www.flybgd.com

One of the big difficulties that pilots had to cope with when flying in fancy dress was the massive drag caused by the disguises. Here, the pilot had problems steering down wind in the lee.



Photo: Valentin Burkhardt

PORCHER SPORT



ADMINISTRATION: France
DESIGN: France
MANUFACTURE: France

FABRICS WHICH HOLD

Very instructional: the comparison of the strain across the bias between Porcher Skytex and a competitor's fabric of the same weight (1). Looking to the future: Porcher are doing trials with fabrics which mend themselves after being pierced (2). After being stretched several times along the bias (3), the hole repairs itself. In collaboration with Kortel, Porcher have produced a 'solid' harness (4), using fabric with carbon composites. The company has therefore demonstrated great flexibility in what they can produce, see next page as well...

WHO'S WHO?

Throughout the year they have listened attentively to the manufacturers: Daniel Costantini (left), responsible for the paraglider and kite market at Porcher, shown here with Bruce Goldsmith.



Photos : Sascha Burkhardt



Photo : Porcher Sport

AT PORCHER SPORT THE FABRIC, THE RAW MATERIAL OF OUR FLIGHTS

PORCHER SPORT



ADMINISTRATION: France
DESIGN: France
MANUFACTURE: France

MADE IN FRANCE

Porcher Industries is a big French group with a worldwide presence. They make all types of technical fabric, for airbags amongst other things, but also for commercial aviation. In the sports sector, their fabric is used for balls, spinnakers, parachutes, kites and, of course, for paragliders.

The paraglider fabric part of their business is always guaranteed 100% made in France. From the design to the manufacture, it all takes place on the group's two sites in Lyon and Grenoble. According to rough estimations, Porcher provides 60% of the fabric for the 30-40,000 paragliders made every year worldwide.

In the following pages we'll look at some of the interesting stages in the manufacture of their fabric...



Photo : Porcher Sport

And you belong to the SKY



KUDOS EN B



www.sky-cz.com

COMFORT
line



Photo : Sascha Burkhardt

To make a very lightweight fabric, such as Skytex, about 10,000 high tenacity polyamide 6.6 threads are coated in a protective layer and rolled up parallel on a big bobbin, this is the warp of the future fabric. One by one, these threads are tied to the previous warps on the loom. This work has to be done by hand, machines can't do it.

THREAD AND FABRIC

The two main manufacturers of paraglider fabric are Porcher and Dominicotex. Just a reminder so that you can better understand the terminology and weights in their ranges: at Dominicotex, the number before the 'D' doesn't give the weight of the fabric, but the weight of the thread in deniers, or, to put it more precisely, the weight in grammes of 9,000 metres of this thread. In Europe at Porcher, they use the unit décitex: 1 km of thread measuring 10 décitex, weighs one gramme (1 den = 1.111 dtx). The threads and weights of different fabrics:

- Porcher Skytex 21 : thread 11 dtx (prototype, 19-23 g/m²)
- Porcher Skytex 27 : thread 22 dtx, simple coating : 24-28 g/m²
- Porcher Skytex 27 : thread 22 dtx, double coating : 27-31 g/m²
- Porcher Skytex 32 : thread 33 dtx et 22 dtx, simple : 30-34 g/m²
- Porcher Skytex 32 : thread 33 dtx et 22 dtx, dble coating 32-36 g/m²
- Porcher Skytex 38 : thread 33 dtx, 36-40 g/m²
- Porcher Skytex 38 : thread 33 dtx dbl coating 40-44g/m² ("Everlast")
- Dominicotex 10D : thread 10 den, weight ca. 25 g/m²
- Dominicotex 20D : thread 20 den, weight ca. 34-35 g/m²
- Dominicotex 30D : thread 30 den, weight ca. 41 g/m²





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The principle of weaving still remains the same: it involves the interlacing of the warp threads (longitudinally) with the weft threads. On modern looms, the weft threads travel at nearly 100 km/h between the warp threads, propelled by a very powerful jet of air.



Photo : Sascha Burkhardt

One of the rooms full of looms: the racket is deafening.

Next, the fabric is washed with its protective coating.



Photo : Sascha Burkhardt

Next, it is put into an autoclave. Inside this giant pressure cooker it will be dyed.

Next, it is rolled out and whilst still damp, goes into another oven for 'thermosetting'.

The fabric shrinks like a pullover which has been washed too hot, but here it is done in a controlled fashion, which contributes to stabilising the fabric in all dimensions.



Photo : Sascha Burkhardt



TENOR
LIGHT EN B

PHI-AIR.COM



Photo : Sascha Burkhardt

Next comes a decisive stage for the fabric: the coating.

Here resides the secret behind any fabric. Shown here the coating machine, which spreads the polyurethane mix on the fabric. Part of the manufacturing process remains a secret, so we were asked not to publish all the details. The layers must be extremely homogenous. Porcher guarantee the weight of the fabric to be within $\pm 2 \text{ g/m}^2$.

The French manufacturer uses a polyurethane coating which guarantees greater stability against deformation on the bias.

On the contrary, silicon-based coatings further reduce the porosity, but lose dimensional stability quicker.

The ingredients and exact quantities used in the coating are, of course, a secret.

Here, an employee adds the ingredients into the container on the scales, scrupulously following the 'recipe'.



Photo : Sascha Burkhardt





A Niviuk tandem Skin 2P: the leading edge is in Porcher Skytex 38, the rest is in Porcher Skytex 32. On a single skin, the quality of the fabric is obviously even more important. The coating plays an important role in its longevity as well as its dimensional stability. The finish is also determined according to the intended use, for example, a 'hard finish' for cell walls.

Skytex 27 on a solo Niviuk Skin P. The 27 is easily recognisable by the large mesh on the Ripstop threads (each square measures about 7.7 mm).

COATING ON WHICH SIDE?

Numerous lightweight fabrics at Porcher are only coated on one side. The manufacturers put this side on the inside of their wings, to protect the coating from abrasion. Both layers of coating on the Skytex 27 classic 2 are, in fact, on the same side of the fabric. With the naked eye, it is difficult to spot. Testing it with a marker can help: if you put a line of felt pen on the non-coated side, the ink flows the length of the threads; on the other side it does so less.

At Dominicotex, they use more silicone in their coatings. They cope with abrasion better and can be put on both sides. Their water-repellent character cope better with dewy early morning take offs. On the other hand, the manufacturers, as well as the testing houses, told us that this fabric loses its dimensional stability on the bias too quickly. This loss could, to some extent, be compensated for by putting an extra line of fabric in the same direction as the weakness. Another possibility: add reinforcements, but this goes against the principle of light weight.



Photo: Sascha Burkhardt

A visual control is always done along the entire surface of each batch.



Photos : Sascha Burkhardt

Other spot tests are done on samples, just as it is done on new fabric which is being developed.

For example, wear is increased by putting the fabric through a washing machine and then attaching it to a friction wheel.



Flapping in the air flow, the fabric is subjected to conditions close to those encountered during real use.

After this artificial aging, which also includes exposure to UV, the samples go back to the laboratory for extreme tests. (Tearing, stretching in every direction, porosity...)





Photo : Sascha Burkhardt



FABRIC TRENDS

Thirteen years ago, Porcher started to develop lightweight fabric with Skytex 27, in collaboration with the French manufacturer Nervures. After an initial distrust of this fabric which resembled 'cigarette paper,' almost all the manufacturers now use it in their lightweight or semi lightweight wings. Even big users of Dominicotex such as Ozone haven't been able to resist this fabric. The all new XXLite2 for example, originally envisaged in Dominico according to our information has, in the end, been certified using Skytex 27.

No doubt to keep its position as market leader, Porcher have been working for years on Skytex 21, which will be lighter still. Initially, they promised us that it would be ready for the Coupe Icare in 2017.

However, even by 2018 it still wasn't ready. One of the reasons is that it is very difficult to manufacture fabric using such thin threads (11dtx): it requires constant humidity during fabrication and can't be woven on the same machines as the other fabrics. As Porcher hope to, no doubt, keep the same qualities which the 27 is known for, (dimensional stability across the bias for example) the engineers are continuing to work on it. They have promised us that 2019, with the X-Alps, will be the right moment!

Rolls of fabric ready for shipping. Above right, rolls of Skytex 27. On each roll, there are 150 metres of fabric 158 cm wide, giving approximately 237 m². A 26 m² paraglider requires between 120 and 150 m² of fabric, including the off-cuts.

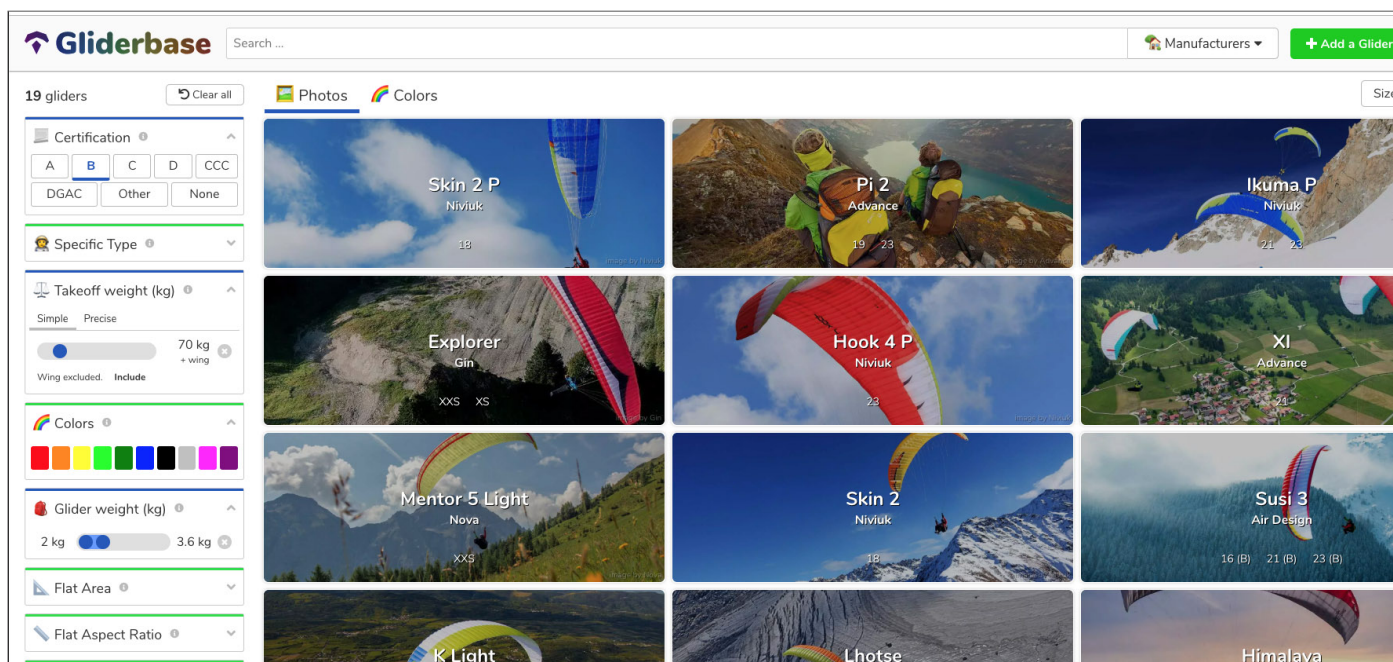
The amount of fabric used for the internal structure is often underestimated: for the cell walls and the diagonals on complex wings, they need as much fabric as for on the upper surface.

So, from one roll, you can manufacture a minimum of one and a half Gin Yeti 4s, for example. The inner and outer surfaces are in 27, except the leading edge which is in 32.

On the other hand, as for lots of mountain wings, its internal structure has been made lighter, which has slightly reduced the amount of fabric used.

Photo : Jerome Maupoint





A database which still isn't complete, but with high-performance filtering, which also allows all the combinations. As far as filtering by weight goes, following our comments, it will soon be possible to go below 2 kg to have a look at modern ultra light wings...
www.gliderbase.com

GLIDERBASE

FINDING A WING

The new site, Gliderbase, was created by a German programmer, Kai-Adrian Rollmann.

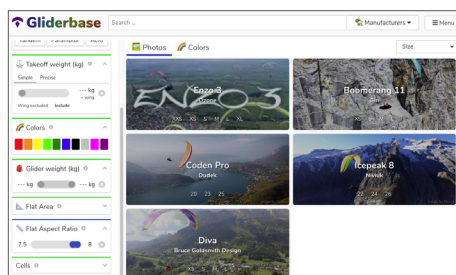
Whilst looking for a wing for himself, he couldn't find a good online tool which would let him look at all the EN A wings on the market weighing less than 4 kg for example, or all the wings with an aspect ratio of 7.

Therefore in 2018 he started to build a database with high performance filtering capabilities. It is also possible to choose several wings so that you can compare them side by side in a table.

The database is developing slowly because Kai is involving the manufacturers, to use their photos for example.

A great idea with a nice, modern interface in contrast to the rather 'year 2000 look' of the most complete database for more than a decade, Para2000, which contains a bit more information, but doesn't let you do as targeted a search, nor can you make direct comparisons...

www.gliderbase.com



Gliderbase		
All gliders	Comparison	
	Enzo 3 Niviuk	Icepeak 8 Niviuk
Size	L	24
Certification	CCC	CCC
Takeoff weight	105-125 kg	95-115 kg
Cells	101	99
Cells (box)	-	27
Cells (closed)	-	14
Glider weight	6.22 kg	6.15 kg
Flattening	-	15 %
Flat area	25.7 m ²	24 m ²
Flat span	13.9 m	13.51 m
Flat aspect ratio	7.55	7.6
Projected area	21.7 m ²	20.6 m ²
Projected span	10.9 m	11.1 m
Projected aspect ratio	5.5	5.98
Chord (avg)	-	1.78 m
Chord (max)	2.31 m	2.2 m

Just a reminder that the site Para2000.org remains the most comprehensive site. It includes virtually all the wings on the market since the beginning of paragliding time!


 A screenshot of the Para2000 website showing a large table of paragliding wings. The table lists various specifications for different models, including size, weight, and performance metrics.

MACPARA



ADMINISTRATION: Czech Republic
DESIGN: Czech Republic
MANUFACTURE: Sri Lanka Skysports

OUTBACK

This year Macpara brought out the Outback, a very universal wing in just one size, 21 m². Depending on the all up weight, it can be used as a speed wing, a mountain wing (for hike&fly) or for thermaling. We are currently testing one and the first flights confirm that despite its small surface, it lets you use thermals easily, even loaded to 80 kg, so in line with hike&fly. It folds up into a fairly small volume and only weighs 2.7 kg. Certified EN B (close to an EN A) it is, all the same, a bit twitchy in turbulence for a total beginner. More details coming soon... 

MANUFACTURER: MACPARA			
Web: http://www.macpara.com/en/outback.html			
DATE			
SIZE	21	21	21
	Thermals	Hike & Fly	Speed Glider
CELLS	36	36	36
FLAT SURFACE AREA [M ²]	20.84	20.84	20.84
FLAT WINGSPAN [M]	9.9	9.9	9.9
FLAT ASPECT RATIO	4.7	4.7	4.7
ALL UP WEIGHT [KG]	55-75	70-90	90-105
WEIGHT OF THE WING [KG]	2.7	2.7	2.7
FREE FLIGHT CERTIFICATION	LTF/EN-B	LTF/EN-B	LTF/EN-B
FF CERTIFICATION LAB	DHV	DHV	DHV
PPG CERTIFICATION			
PRICE [€]	2600	2600	2600
Materials:			
Top surface: Skytex 32 Universal - 32 g/m ²			
Bottom surface: Skytex 27 Classic II - 27 g/m ²			

Engineer and former member of the Czech national team, Peter Reček founded MacPara Technology in 1991. Since then, he has always designed the paraglider and paramotor wings himself which, up until 2006, were made exclusively in his own workshops in the Czech Republic. The large quantity of production wings has forced him to have some made in Sri Lanka.

WHO'S WHO?



A great toy which is very universal: the Outback 21.



Photos: Véronique Burkhardt Pilote: Sascha Burkhardt



Left: Shimgo, the right hand man in production who has worked with Gin Seok Song (right) for thirty years. The harness: a Genie Race 4 in 'firecracker red'.

GIN



ADMINISTRATION: Corée du Sud
DESIGN: Corée, Europe
MANUFACTURE: Corée, Chine

WHO'S WHO?

GIN SEOK SONG, FORTY YEARS OF FREE FLYING.

Forty years of free flying and twenty years of GIN the company, meant that there was plenty to celebrate.

It was also a great occasion to get to know some of these unique characters a bit better. When he was young, he had a motor bike accident and the doctors thought he would never walk again. But walk again he did. Determination has always been Gin Seok Song's motto... He started to walk again against all the odds, and forty years ago he also started to fly hang gliders. A bit later, he flew his first paraglider, a wing with seven cells which was unstable and concertinaed. He said to himself, 'I'm never going to fly a thing like this again.'

But oh yes he did, he even designed his first wings for UP in 1990, in particular, the famous 'Flash.' He then spent a bit of time with André Bucher's Edel until 1997, when he founded his own company in 1998, with the success that we all now know.

At the Coupe Icare, there was a group of "Samulnori" musicians "Samulnori," playing Korean percussion music.



Photo : Sascha Burkhardt



Initially GIN made mainly personalised wings like the famous Boomerang for international competitions where he was taking part. The Bonanza 1 was the first production wing. Gin's motto: design wings he would want to fly himself.

But Gin is also a father figure at the head of the GIN family. He clearly knows how to bring his team together and many have remained loyal to him for several decades.

Gin has personally invested a lot in the future of the North Koreans. Despite the dictator Kim Jong Un confiscating his factory in Kaesong, Gin remains convinced that 'this man still has potential.'

His dream: to one day be able to continue to fly the length of the long mountain chain towards the north, beyond the border with its mine fields which has forced them to stop flying, whilst the potential remains enormous.

His dream: to organise an international paragliding competition in North Korea. And also: 'I would like to take the North Korean First Lady, Kim Jong Un's wife, flying in a tandem.'

After forty years of free flying, Gin Seok Song's optimism and determination definitely remains as strong as ever.

WHO'S WHO?



Photo : Sascha Burkhardt

To the right of Gin Seok Song is one of his loyal colleagues: Michael Sigel. Having won several World Cups, he also won the 2017 Super Final.

[See his pilot profile here.](#) He also won XContest in 2018 with free flying distances of 533, 514 and 482 km, an FAI Triangle of 287 km, an out and return of 288 km etc.



BONANZA 2

A quick look back at GIN's story: after two years of development and twenty years after the first "Bonanza", which was one of the first production wings (DHV 2-3, AFNOR "Performance"), GIN have launched the Bonanza 2, packed with modern technology and with all the know how gained over the last forty years.

GIN promise, amongst other things, exceptional performance across the whole speed range, easy inflation in all kinds of wind, great stability even when accelerated and optimum pitch control in all conditions.



BONANZA 2 TECHNICAL DATA						
MANUFACTURER : GIN						
Web : http://gingliders.com/home/bonanza-2-for-xc-purists/						
DATE	2018	2018	2018	2018	2018	2018
SIZE	XXS	XS	S	M	L	XL
CELLS	71	71	71	71	71	71
FLAT SURFACE AREA [M²]	19.4	20.7	22.6	24.5	26.5	28.6
FLAT WINGSPAN [M²]	11.18	11.54	12.06	12.56	13.06	13.57
FLAT ASPECT RATIO	6.44	6.44	6.44	6.44	6.44	6.44
ALL UP WEIGHT [KG]	60-75	65-85	75-95	85-105	95-115	105-130
WEIGHT OF THE WING [KG]			5.15	5.3	5.7	
FREE FLIGHT CERTIFICATION	EN-C	EN-C	EN-C	EN-C	EN-C	EN-C
Materials:						
Top surface: Porcher Skytex, 32 g/m2 (water repellent)						
Bottom surface: Porcher Skytex, 32 g/m2 (water repellent)						



Photo: Jérôme Maupoint

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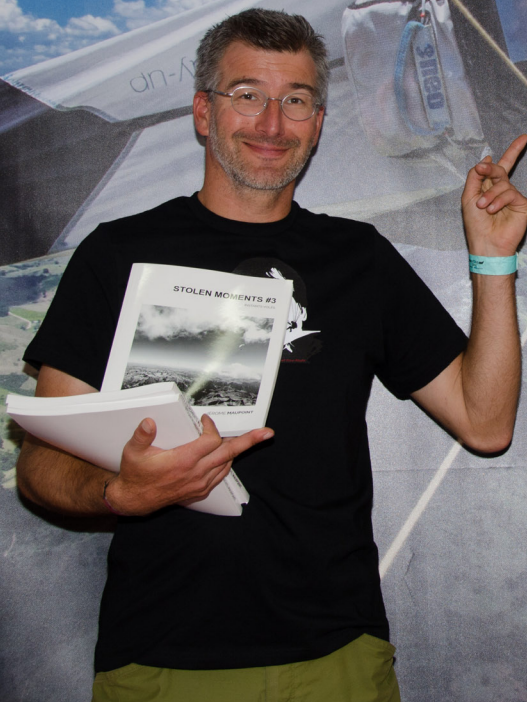
highadventure.ch

ha
highadventure
CREATIVE PILOTS



WHO'S WHO?

Another equally faithful follower of GIN for the last twenty years is one of paragliding's most talented photographers, Jérôme Maupoint. At the Coupe Icare he launched his amazing new book, Stolen Moments 3. A great Christmas present idea for pilots! www.jeromemaupointphotography.com/



SUPAIR



ADMINISTRATION: France
DESIGN: France
MANUFACTURE: Czech Republic, Thailand

SUPAIR

The harness research laboratory team has been strengthened by the addition of Romain Rousset. Despite the expansion of the range of paragliders, harnesses remain important: Supair produce thousands of harnesses per year; the figure could be around 10,000.

Two very important new products:

The Skypper 2 is a high performance XC harness designed for demanding pilots who fly regularly. It's a completely new harness with the same ethos as the first Skypper, with clutter and weight kept to a minimum, but with performance and precision.

Sizes: S/M/L/XL

Weight: 5,700g in size medium (harness, back protection, bump, carbon seat and foot rest).

The Delight 3 is a lightweight XC harness, precise to steer and equipped with optimised passive safety. They have reused the successful points of the Delight 2, whilst improving the back support, safety and accessories. For example: a safety leash for use in the event of a tree landing, developed in collaboration with the PGHM (Pelotons de Gendarmerie de Haute Montagne).

Sizes: S/M/L/XL

Weight: 3,700 g in M. (harness, back protection, bump, carbon seat and foot rest).

The organisation, following the purchase of Gradient, is working well now. The design of the Supair and Gradient wings remains separate, but the production is all done at Gradient.

This company has had to adapt at several levels. They have needed to, for example, sew in SharkNose profiles, which isn't straightforward. 🐋

www.supair.com

WHO'S WHO?

Some of the Supair team:
 Pierre-Yves Alloix, Laurent Chiabaut,
 Clement Latour, Romain Rousset and
 Lukáš Pohl (Gradient)



NEW FEATURES

+ POWER

leGPSBip⁺

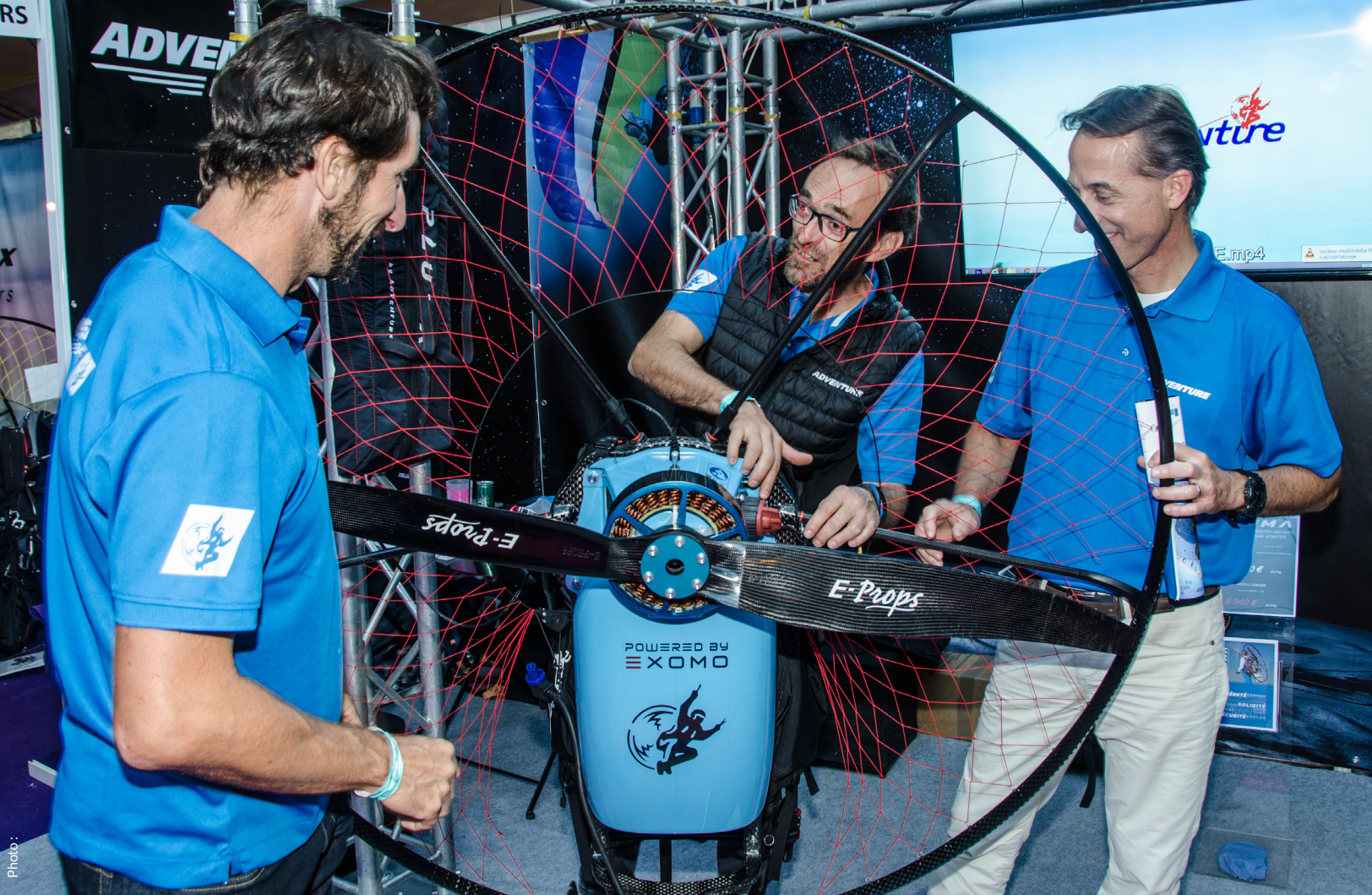
SOLAR VOCAL GPS LOGGER - INSTANT VARIO WITH ACCELEROMETER



FREE SHIPPING ON STODEUS.COM

The Supair Step is the new EN B+ from Supair. This wing should fill the gap between the Leaf and the Taska. The Taska was almost B instead of C, you just have to be gentle with it to get it back down into the EN B classification. We're testing it at the moment and will have the verdict soon...





ADVENTURE



ADMINISTRATION: France
CONCEPTION: France
FABRICATION: France

WHO'S WHO?

The team who own the make: Pascal Vallée, Emmanuel Layan and Andrea Testoni around an electric motor which has finally come to fruition.

FOLLOWING THE CURRENT TRENDS

The French manufacturer has always been a pioneer in chassis and motors. We remember the first electric motors that Adventure tried out a long time ago. Since then, the company have waited for this type of motor, which is becoming an increasing trend, to come to maturity. Now they collaborate with Exomo, who for the last three years have demonstrated the reliability of their machines. So that the 'electric' solution becomes really workable, it has been necessary, amongst other things, to improve the power and battery life. Now, you can therefore fly an Adventure electric motor 15 kW (20 HP), powered by Exomo, with a weight of 26-30 kg, thrust between 50 kg and 70 kg depending on the propeller, with 35 to 50 minutes of operation depending on the battery.

Prices start at 14,500 €.

SPENDING POWER

A good idea: at Adventure, you can now buy a kit paramotor and save up to 1,300 € depending on the configuration.

A nice contrast: a kit, as you would see in Ikea, which metamorphoses into a high-tech carbon fibre gem.

Talking of carbon fibre, since the first versions of the PLUMA, the carbon fibre arms have been reinforced, a request which came particularly from acro pilots.



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 or your glider type

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or **V2 + V3**
 with a reversible KIT

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www.mycameleon.fr




ADVENTURE ATOM 80

The all new Atom 80, which was launched at the Coupe Icare in 2017 as an advanced prototype, has finally been included in the Adventure range. This little 80 cc delivers about 16 HP at 9 500 RPM. With no extras, it only weighs 10.5 kg. This allows pilots weighing less than 80 kg to fly ultra-light, less than 18 kg with a PLUMA chassis.

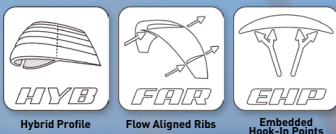


Photo: Bruno Lavit

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EN-B*



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Embedded Hook-In Points

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*Load test pending

APCO AVIATION

Photo using APCO camera magnetic mount positioned on the wing.



Looking pensive before taking off. In any case, it isn't an easy launch from the carpeted take-off at Saint Hilaire (in the lee of the wind over of the edge), especially with the extra drag from the disguise. Well done.

Photos : Valentin Burkhardt



GROUNDHANDLE
VEST: MARTINI

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CAMÉLÉON



ADMINISTRATION: France
DESIGN: France
MANUFACTURE: France

Ten years after the first launch of the fairly revolutionary Cameleon throttle, which allowed the motor to be finger operated, just by moving the middle or index finger, AEF gliders have announced that, for the end of the year, they will have another product: the Exo.

This new throttle is the fruit of two years of work, with six versions and twice as many prototypes. It is aimed at all the pilots who don't want to abandon the 'bicycle brake lever' system, painstakingly learned in paramotoring school.

This 'twenty first century throttle' will offer new ergonomics, and is extremely compact, with no prominent parts which could catch the lines, and is left/right reversible. It is made from PA66 whose strength was put to the test in the Cameleon.

WHO'S WHO?

Gérard Lésieux, the owner of AEF Gliders has already successfully invested tens of thousands of euros in the Cameleon. Now he is doing the same thing with the Exo...





The cruise control will be adjustable to a high level of precision and finesse and can be released by flicking the trigger in an emergency.

Another little modern detail: for the only part which can wear out in the handle, a 3D file is included, which works on any 3D printer in the world. The Cameleon throttle is, of course, still available. 🦎

AEF Gliders: the new handle



Photos : Sascha Burkhardt



Photo : Sascha Burkhardt

WHO'S WHO?

Sissi Eisl, one of the highest placed Austrian pilots in the national league, takes over the reins at Nova replacing Wolfgang Lechner, who will, none the less, remain with the company.

It is unfortunately still rare to see a woman at the head of a paraglider manufacturer...



NOVA



ADMINISTRATION: Austria

DESIGN: Austria

MANUFACTURE: Hungary (55%),
Vietnam Aerotakt (45%)

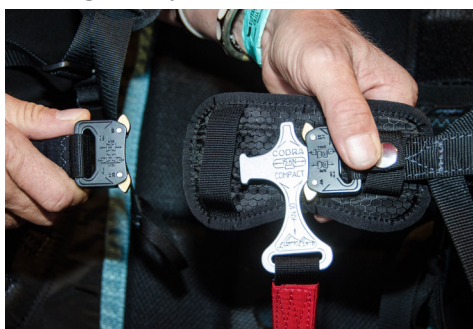
The EN C Nova Sector, with its moderate aspect ratio of less than six, won the German, Swiss and Austrian Federation distance competitions for serial class EN C wings. The pilots were Werner Schütz, Urs Haari and Armin Leitner.

NOVA VENTUS

A 'simple, safe and innovative' harness with lots of clever details. This is the first harness designed entirely by the Nova R&D team. It includes a high-performance back protector which takes up very little space when packed. In addition, it has an anti-puncture system in the upper part of the back.

Nova promise that the release mechanism for the reserve will be easy, whatever the angle of force on the handle. Sizes S/M/L. Weight: 4.4/4.7/5.2 kg.

A nice little detail: padding between the front fastening and the pilot.



WHO'S WHO?

Toni Bender shows us the extra protection in the back of the Ventus. Toni was one of the founder members of Nova back in 1989. He is also one of the pioneers of 'hike&fly'.



Photo : Sascha Burkhardt



Photo: Nova

NOVA PENTAGON : WATERPROOF!

FABRIC WHICH CAN COPE WITH WATER


Unlike paraglider fabric, the porosity of reserve fabric is, as a general rule limited, not by a coating but by calendering. This is the passage between two heated cylinders which crushes and flattens the fibres. This is the case for example with Porcher's PN9, but others do exist.

Manufacturers such as Independence and Nova as well as the association of manufacturers, the PMA, emphasise that lots of fabric for cheap reserves is made waterproof by adding a coating, whose water resistance can be poor. As a consequence, after an SIV course involving a water landing, the porosity will be greatly increased, and thus the sink rate will also increase the next time it is thrown.

Some polyamid lines can also shrink after a water landing, provoking changes in the trim, with a risk of it being slower to open and having larger oscillations.

Nova informed us that the new Pentagone is:

- made from Porcher PN9 which is reputed to cope with water landings without being damaged
- uses pre-shrunk lines
- uses lines which are the same length. As a consequence, the symmetry of the trim remains identical even when there is shrinkage.

- will, in any case, not be very sensitive to incorrect trimming according to the tests carried out. 

For more information:

www.nova.eu/en/parachutes/pentagon/

Not even over water, but even more courageously over dry land: a test throw of a Pentagon.





Photo: Veronique Burkhardt, Photo: Sacha Burkhardt

PHANTOM, FREE FLYING AND WITH A MOTOR

The Phantom which came out in 2016 quietly continues its expansion across the market. This extraordinary EN B for free flying, is also certified for with a motor.

PERFORMANCE AND COMFORT

We have already introduced the Nova Phantom: a 99 cell wing, full of technology, certified EN B, with the performance of a good EN C.

This performance has been developed together with undeniable comfort. The pilot feels safe, amongst other things, thanks to the good pitch stability of the wing. The Phantom gives a feeling of rigidity; it goes into thermals without deforming, whilst remaining 'gentle'. It absorbs the turbulence and sometimes even retains some bits of feedback but, in exchange, even a pilot with relatively little experience can attack air which is a bit more uncomfortable.



Photo : Urs Harp

In the roll, the wing is also well damped and stable. Yet the turns are precise and efficient; it banks straightaway at a reasonable angle. It also excels in weak thermals, by allowing flat turns.

Moreover, the wing also inflates very well, this works even without the As in your hands!

WITH THE MOTOR

For use with a motor the Phantom is delivered with special risers, which also have trimmers. Obvious, the good inflation and the rapid load take up are an advantage when taking off with a motor too. In flight, it has the same comfort and the same feeling of safety and coherence as when free flying which encourages the pilot to attack when flying with a mix of thermaling and motor. Despite the weight of the switched off motor on your back, it feels fine in thermals and moderate turbulence. It is therefore a wing for taking off in the landing field and getting into the thermals! The speed (which we measured at 37 km/h hands up, 50 km/h accelerated) is typical of a paraglider and obviously doesn't allow it to rival a reflex wing, but it is sufficient for nice XC flying.



Sascha Burkhardt

Photo : Véronique Burkhardt



BEHAVIOUR WHEN HEAVILY LOADED

We asked our test pilot Estéban Bourouffiès to carry out a few manoeuvres, with an increased all up weight, which is typical with a motor, with trimmers open and closed:

"Whether with trimmers on or completely detrimmed, reopening after asymmetric collapses happens in two stages. The wing goes into a little bit of a roll which fully reopens the leading edge at the centre of the wing, next, the wing tips reopen by flicking towards the outside.

It reopens fairly quickly with a half second lag, the time that the wing takes to start the roll and reopen.

Trimmers on, the roll angle is low and the change in direction is about 20°.

Detrimmed to maximum the roll angle is moderate, and the change of direction is about 45°.

Flying untrimmed, the Phantom becomes completely rigid. Its increase in speed gives it a good glide thus preventing it from being subject to turbulence and allows it to remain solid. It flies as if on rails, which, as a consequence, makes it lose a little bit of its feeling of the air mass, but on the other hand, it remains comfortable in accelerated flight"

Nova's SharkNose brings advantages when both free flying and paramotoring. Without a doubt it contributes to the undeniable coherence when flying both fast and slowly.



Photo: Véronique Burkhardt



The 'Needle ribs' are the Diagonals which cross the cell walls then attach further on so that they spread the forces out better.

It is made entirely from Skytex fabric:
The leading edge is Skytex 32 Universal
The upper surface is made from Skytex 27 Classic 2
The lower surface is made from Skytex 27 Classic 1
Cell walls (with an attachment point) Skytex 32 Hard
Cell walls (without an attachment point) Skytex 27 Classic 1

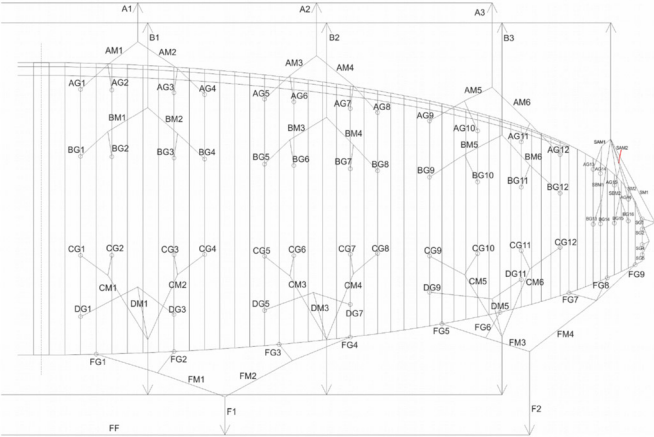




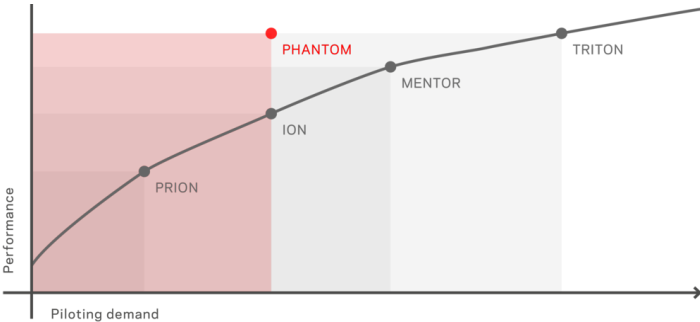
The risers which are specifically for use with a motor can also be used when free flying. In this case, you should just use the foot accelerator, as opposed to with the motor, where you are supposed to work just with the trimmers.



Photo : Sascha Burkhardt



Nova place this wing as a 'low EN B,' but, as far as performance is concerned, it is level with the Triton.



PHANTOM TECHNICAL DATA				
MANUFACTURER NOVA				
Web : www.nova.eu/fr/parapente/phantom/#c9376				
DATE	2017	2016	2016	2016
SIZE	XS	S	M	L
CELLS	99	99	99	99
FLAT SURFACE AREA [m²]	23.52	25.84	28.16	30.46
FLAT WINGSPAN [m²]	11.05	11.58	12.09	12.58
FLAT ASPECT RATIO	5.19	5.19	5.19	5.19
ALL UP WEIGHT [kg]	60-90	80-100	90-110	100-130
WEIGHT OF THE WING [kg]	4.8	5	5.25	5.5
FREE FLIGHT CERTIFICATION	B	B	B	B
CERTIF. LAB	DHV 04/2017	DHV 10/2016	DHV 10/2016	DHV 10/2016
PPG CERTIFICATION	DGAC 10/2017	DGAC 10/2017	DGAC 10/2017	DGAC 10/2017
PRICE [€]	6420	6420	6420	6420

Materials:
Skytex 32 Universal
Skytex 27 Classic 2,
Liros PPSL 191 / TSL 140, Risers : Kevlar 12mm

For pilots looking for a universal wing for both free flying or with a motor, with a very high level of safety and good performance, this wing is, no doubt, perfectly suited. Although a bank account to match is required. Photo: Nova.



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WINDSRIDERS



ADMINISTRATION: France
DESIGN: France
MANUFACTURE: France, Nepal

WINDSRIDERS

The company manufacture, amongst other things, down jackets and other warm, lightweight clothing. Everything is made in Nepal where local projects are supported.

A new accessory (in English and French: a foldup notice to help you thumb a lift. Folded, it is only 12 cm in diameter, 200 g, 14 €.

www.windsriders.fr



WHO'S WHO?

Nathalie and Philippe Lami created their small business after a hiking trip in Nepal...

Photo: Sascha Burkhardt



As always, the program was rich in activities based round flying.



Photo : Johan Chemin

Stunning views of the Dent de Crolles, the Plateau des Petites Roches and the cliffs below.



Photo : Bruno Lavit



Hyper

Dein täglicher Begleiter

Bedienerfreundlich

Taschenformat

Hike&Fly-Modus

Top-Kundenbetreuung

www.naviter.com



Photo : Bruno Lavit



Photo : Alain Douce

A flying simulator, activities for children, and of course, the manufacturers' stands. Covering nearly 6000m² the ICARE EXPO was comprised of more than two hundred stands.



PARAGLIDING TECH

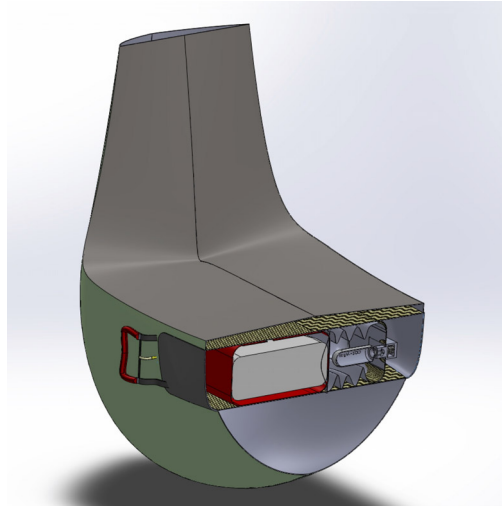
RESERVE EXTRACTOR

Jean Philippe Gallat is a doctor and the inventor of a new system of reserve extraction.

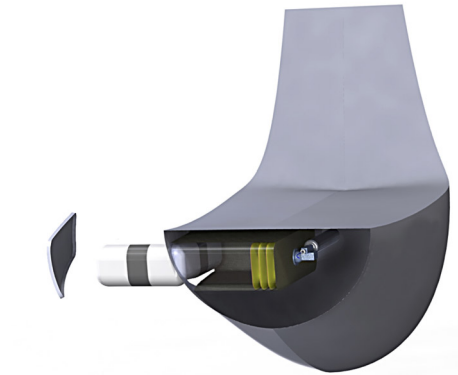
Extraction systems have long been experimented with, but here Jean Philippe is clearly, actively looking into the subject from an unusual scientific and technical rigour.

The reserve is forced out by gas (CO₂ or Argon). It is even envisaged that you could use any surplus from the gas bottle to further inflate the airbag in the harness.

The designer is looking for another brand to become a partner with. For more detailed information:
www.paragliding.tech 



Depending on the version, a manual handle is still retained.



The speed of ejection is about 10-12 m/s, which is fast and could significantly reduce the opening time.



The bottle is pierced by a safe mini pyrotechnic system.



This 'airbag' fills with gas and ejects the reserve.



The system was patented by Jean Philippe.

ICARO2000

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Nerv Black & Green



Nerv Deep Forest



Nerv Blu



Nerv Carbon Optic



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Nerv Carbon White

www.icaro2000.com
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TRENDS: KNOTS

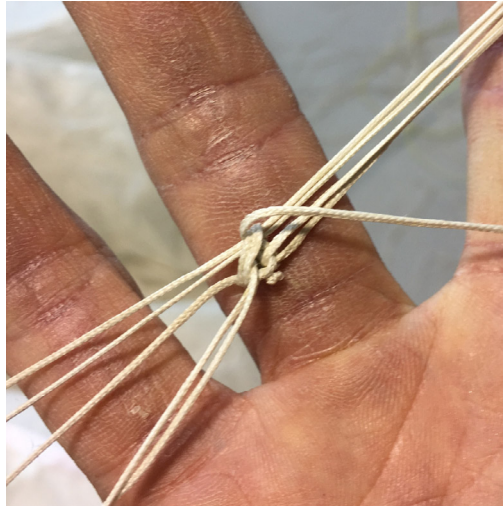
METICULOUS PREFLIGHT CHECKS!

Horizon Réparations is one of the oldest repair centres for paragliders in the world. Its owner, Nicolas Brenneur, who also has lots of experience as a designer, talked through the latest 'trends' in glider faults as well as errors in maintenance committed by pilots. For example, with lines becoming thinner and thinner, they are finding more and more knots in the lines when they are checking them. Often these knots have been there for many flights. Without realising the cause, pilots complain of different problems when flying: the wing is slow, it turns, it goes parachutal or goes into a flat spin! Shown opposite, are a few examples, the consequences of which are variable: failed inflations, flights which have gone wrong, a fractured pelvis, a damaged spine, two broken legs...

HIS ADVICE

Even a very little knot can ruin your life, so check your lines regularly, especially the thin ones high up. Normally breaking a very thin line isn't a problem. On the other hand, a line which pulls down a panel by 15 cm due to a knot has a big effect, and adds a risk of reduced speed, a stall or a spin.

There is more information along these lines on Horizon Réparation's blog. [Horizon Réparation](#) 



Serious: a knot which caused the owner of the wing to fracture his pelvis.

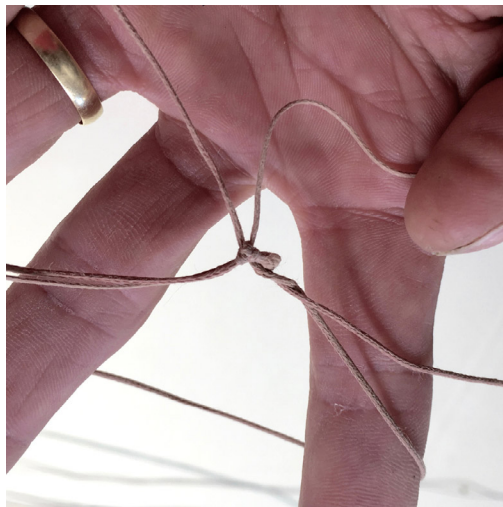


Not serious: unlike knots, this type of incident is totally benign, a thin brake line which breaks, shown here after a windy take off on rocky ground.

Not very serious: a case where a splice opens. The line, nevertheless, remained blocked in the right place.



Below, a few more worrying cases of knots which have remained in for several flights and caused incidents which varied in their level of gravity.



PHI



ADMINISTRATION: Austria
DESIGN: Austria
MANUFACTURE: Sri Lanka Aero Dynamics

PHI

The team around Hannes Papesh, Mike Küng and Benjamin Hörburger have launched a significant number of models for a brand which is a relative new comer.

The EN A Viola is a Sonata Light. As expected, its reactions to incidents are even 'softer' than that of the heavier version. This has allowed the all up maximum weight to be increased by 15 kg. A Viola 18 will therefore be a very good EN A school wing loaded to 55 kg, but is also certified EN B as a high-performance mini wing with an all up weight of 110 kg! Equally surprising is the number of sizes: eight for the Viola compared to five for the Sonata. Clearly the Viola is a hike&fly wing which is very versatile. See our first test further on.

The EN B Tenor light remains, on the other hand, in the same sizes as the Tenor. The fabric is Porcher Skytex 32/27 instead of the Dominico Tex used on the classic Tenor.

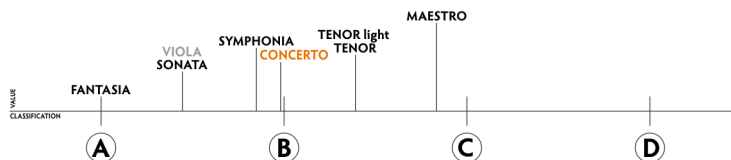
WHO'S WHO?

Hannes Papesh, Benjamin Hörburger and Franziska Bucher at the Coupe Icare showing how the Phi wings are created.


Silvia Hobohm and Mike Küng with Nala in the middle.



An unusual concentration of models in the A and B categories...



Talking of 'light': Phi are even thinking of making a wing for the 2019 X-Alps. But, as yet, we know neither the name of the wing nor that of the pilot who will fly it...

We also know that Phi are working on single skins as well as on a two-line model but, for the moment, Hannes is keeping this secret. 

The Tenor and the Tenor Light are placed in the middle of the EN B category.

A prototype of the Maestro (EN B+), which should still be launched this year.



The Concerto is a very universal tandem, 36 m² with a large all-up weight range (120-240 kg) and three lines, which should suit both the pros and the amateurs.

CONCERTO TECHNICAL DATA

MANUFACTURER : **PHI**

Web : phi-air.com/project/concerto/

DATE	2018
SIZE	36
CELLS	50
FLAT SURFACE AREA [M ²]	41.95
FLAT WINGSPAN [M ²]	14.68
FLAT ASPECT RATIO	5.14
ALL UP WEIGHT [KG]	120-240
WEIGHT OF THE WING [KG]	7.5
FREE FLIGHT CERTIFICATION	EN/LTF-A

Materials: Porcher Skytex 38, Easyfly





The Viola, the lightweight version of the Sonata.

FIRST IMPRESSIONS.

PHI VIOLA

Stefan Ungemach has done a quick test of one of the first samples of the Viola 18. Here is a condensed version of his first impressions.

With its aspect ratio of 4.72, the Viola is closer to an AD Susi 3 (4.85) than an Ozone UL 4 (4.5). What's unique about the size labels of these models is that the 18 refers to the projected surface area (18.4 m²) and not the flat surface (21.4 m²), as is the case with the majority of other manufacturers. This is a tradition with Hannes Papesh. It's weight of 2.78 kg for a wing of this size is more than correct, especially as it has classic risers, which therefore make it a lot easier to steer during take-off than the 'dyneema string' risers which always require a lot of care to avoid getting them twisted. Unusual on the Viola: the brake handles are fixed with Velcro bands.

Contrary to numerous other mountain

wings, the lines are all coloured and sheathed, this greatly helps preparation on high, rugged mountain take offs. You can inflate the wing from being balled up as only rarely does a stabilo get caught. As it has a different coloured line, it is easy to spot and give a tug. On the ground, the wing is very easy to control with the Cs.

The wing is very light and comes up very easily, even in very light wind. Given the ease with which it comes up and is controlled, we shouldn't overlook that the lift at take off of a wing of 21.4 m² (18.4 m² projected), especially with a low aspect ratio, will be quite weak and may require a few more steps to take off.

In the air the Viola is both solid and very manoeuvrable. It is reassuringly solid in turbulence.



A wide riser, but without any metal. Even the hooks on the accelerator have been replaced by a ball.

It has a very small volume when folded.



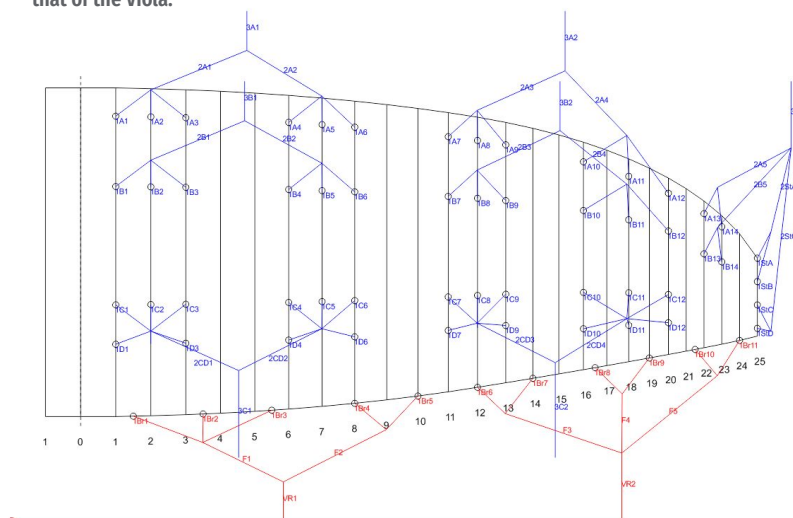
As far as performance is concerned, we weren't able to collect sufficient precise measurements. We'll do that during the full test. It is, in any case, surprisingly efficient in thermals, to such an extent that you tackle them calmly. The profile comes from the Symphonia, so it is not a surprise that it is efficient. On the other hand, it will obviously have a bit less performance in accelerated flight as there are fewer cells. Nonetheless, the Viola will no doubt take its pilot on great XC flights after launching into the wild.

Ears: As the As aren't separate, you have to take the corresponding A line very high up to pull in ears.

When landing with very little wind, you have to accelerate and be a bit more precise with the timing than on a bigger wing to get a nice flare, which is only logical.

On the other hand, the volume of the packed Viola is very low. The weight, which is a bit more (about 500 g) compared to certain of its competitors, is totally justified by its behaviour on difficult mountain take offs.

The line plan of the Sonata is identical to that of the Viola.



The Viola was certified in the DHV laboratory.

VIOLA TECHNICAL DATA								
MANUFACTURER : PHI								
Web : https://phi-air.com/project/viola/								
DATE			2018	2018	2018			
SIZE	XXXX 14	XXXX 15	XXS 16	XS 18	S 20	M 22	L 24	XL 26
CELLS	40	40	40	40	40	40	40	40
FLAT SURFACE AREA [m²]	16.36	17.68	19.04	21.43	23.71	26.1	28.32	30.81
FLAT WINGSPAN [m²]	8.78	9.13	9.47	10.05	10.57	11.1	11.56	12.05
FLAT ASPECT RATIO	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72
ALL UP WEIGHT [kg]	55-90	55-90	55-90	55-90	65-100	75-110	90-120	105-145
FREE FLIGHT CERTIFICATION	C	C	B	A	A	A	(A)	A
WEIGHT OF THE WING [kg]	2.2	2.35	2.5	2.78	2.99	3.25	3.5	3.75
WEIGHT RANGE EXTENDED			90-110	90-110	100-120			
CERTIFICATION EXTENDED			(C)	B	B			
Materials: Porcher Skytex 32/27 () Planned								

PENTAGON



PENTAGON

The five-sided parachute
with high pendular stability

- _ oscillation damping
- _ fast opening
- _ slow to descend
- _ water-resistant materials
- _ uncomplicated packing

Available in 3 sizes: 100 / 120 / 145

www.nova.eu/pentagon

NOVA

ORGANISATEUR



ADMINISTRATION: France
DESIGN: France

WHO'S WHO?

Daniel Raibon Pernoud has been at the head of the Coupe Icare organisation for the last 45 events! At 72 years old, he promised us that he would organise the 46th event in 2019, then he would pass the torch onto somebody else.

It's an enormous responsibility to organise an event of this size with tens of thousands of spectators. Funnily enough, he never complains. Well done Daniel!

Photo: Sascha Burkhardt



KANGOOK



ADMINISTRATION: Canada
DESIGN: Canada
MANUFACTURE: Canada

LIGHTER STILL

Kangook have made an especially light chassis, the X-Lite. To allow this extra reduction in weight, Kangook are not making this model of chassis compatible with all the motors on the market. It is only available for the Vittorazi Atom and the Polini Thor 80.

For greater stability and reliability, the cage is in three parts rather than using a system similar to the Trekk.

WHO'S WHO?

David Rouault who is the owner of Kangook founded the company in 2008. He is also the designer. Shown here, he introduces the Kangook X-Lite with an Atom motor: 18.5 kg.



Photos : Sascha Burkhardt



Photos : Kangook

Shortly after his return from Saint Hilaire, David Rouault's manufacturing workshop burnt to the ground, one spark was enough. He and his employees were able to save the templates, which were the most important thing, but all the machines and stock were reduced to ash. The motors and wings weren't insured, the insurer having refused to cover 'flying machines.' For those who would like to help, a fund has been set up:

Kangook Fire Fund.

Just eight days after the fire, Kangook restarted production of their machines in a temporary workshop.

On the way up: Corsair motors, shown here, the high-performance Black Bull in a Classic chassis.





The manufacturer's four stroke Aero 1000 engine (250 cc).

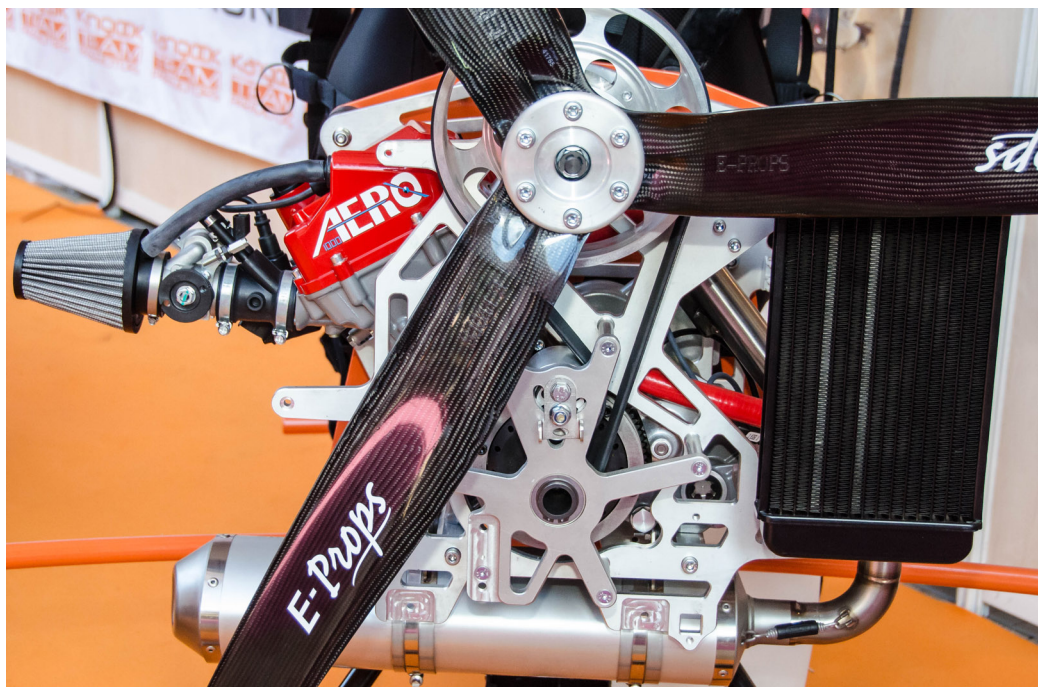
Helvenco (successor of Swiss-Auto), with injection (which of course compensates as a function of the altitude), is available in a Nanook trike.

The typical advantages of a four-stroke engine will be even greater than those of the older four-stroke engines with carburettor such as the Briggs & Stratton.

So, for 16,900 €, the pilot will have a tandem trike which consumes less than 5 l/h, with very little vibration, 37 HP and a thrust of about 110 kg.



Photos : Sascha Burkhardt





WHO'S WHO?

Joseph, the director of DaVinci Gliders at the Coupe Icare. He and Flow worked together on the same wing (Davinci XChord/Flow XCRacer, tested here). The two companies have now ceased this cooperation.





A two-minute quick review of the films. The trailers of the films selected are shown on the following pages.

THE 36TH COUPE ICARE FILM SHOW

There were a record number of entries this year, with ninety-three amateur and professional films competing. Fifteen were selected for the 'IN' festival in the evening, and twenty-eight were chosen for the 'OFF' selection in the morning.

A jury made up of professionals from the worlds of sport and photography, as well as a jury from the European press (representing free flying magazines), were present at each screening. After a final deliberation the respective prizes were given at the awards ceremony.

PROFESSIONAL JURY

- Sébastien Laugier (France): Producer and director (Société Philéas Image)

-Cécile Neff (Canada France): Organiser of the French

tour of the Banff mountain film festival.

Andrew Pagnacco (England): Investigative journalist for the BBC and writer for Cross Country magazine.

- Magali Rebeaud (France): Aeronautical journalist for specialist magazines. Writer and consultant

- Johannes Hogebrink (Holland): Director, designer and illustrator.

PRESS JURY

- France: Voler.info/Free.aero magazine, Parapente +, Parapente Magazine, Vol Passion and Paramag.

- Foreign: Cross Country International (UK), Thermik Magazine (Austria), Volo Libero (Italy), Parapente Vuelo Libre and Ojovolador (Spain)



BLUTCH

GOLD ICARE AND KIDS ICARE

« BLUTCH » producer: Nicolas Alliot. Length: 50 minutes. France (St Hilaire and Lumbin primary school). Jean-Yves FREDRIKSEN alias « Blutch », shares with us his latest crossing of the Himalayan chain by vol bivouac.
<https://vimeo.com/287914529>

Yet another amazing, epic, moving adventure. One to watch over and over again, but we also recommend reading his new book: 'Vol au-dessus de l'Himalaya,' published by Paulsen.:
<https://www.editionspaulsen.com/vol-au-dessus-de-l-himalaya-1981.html>



FLYING FISH

HONORIN HAMARD
PARAGLIDER PILOT AND FREE DIVER

ICARE PRIZE FOR THE MOST BEAUTIFUL ENCOUNTER

Producer: A. Boisselier and C. Tongviet. Length 40 minutes. France

Portrait of Honorin Hamard, Paragliding World Champion and talented free diver for twenty-five years.

A story which flows well and shows how encouragement from your family and friends breed success in every challenge we face in life.

<https://vimeo.com/287864529>



B'HIKE AND BASE

FUN ICARE AND ICARE PUBLIC

« B'HIKE AND BASE », producer: Jérémy Condamine. twenty jumps.
 Length: 20 minutes. France

In September 2017, Frank Malleus, a twenty-seven-year-old from Nice, set himself a challenge: cross the Alps, from Switzerland to the Mediterranean, on a bike, with his base-jumping rig.

A great story with rhythm, great scenery, adrenaline, and fun moments shared with friends. Enough to make you want to go and have your own adventure. And as Frank put it: 'You don't need to be extraordinary to do extraordinary things.

An expedition covering 1,200 km in forty days including <https://www.youtube.com/embed/4mg9Y0W7VYY>



IT'S A BIRD THING

UFO-ICARE

«IT'S A BIRD THING» by S.Bonnet, J.Gautheret, M.Le Gloahec, M.Ly, J.Nizard, L.Pieri, A. Roncancio, J.Souillet and L.Vincent. Length 6 minutes. France

In the heart of the favelas, a little boy called Aaron leads a lonely and miserable existence. Until the day when he sees an

amazing bird flying overhead. From then on, he does his utmost to achieve his objective: Flying!

A nice animation for little, and not so little kids! A fantastic amount of work has gone into this short film!

<https://player.vimeo.com/video/288769372>



ZAZAK'AILES

THE FLYING KIDS OF MADAGASCAR

ICARE FAVOURITE

ZAZAK'AILES, the flying kids of Madagascar. Producer: Prisca Ari. Length: 10 minutes. France/Madagascar

The Vezo, a fishing community in the south of Madagascar is affected by industrial over-fishing and their future is threatened. Initiating the young people of this community into paragliding was an alternative which allowed some of them to

earn a living developing this activity.

A film full of humorous moments and spontaneity, filmed on this island of a thousand contrasts, where the human factor is dominant and the hope is to assure a better future both economically and ecologically.

<https://player.vimeo.com/video/289147448>



MAGIKISTAN

'OFF' ICARE

« MAGIKISTAN », producer: Guillaume Broust. Length: 14 minutes.

of 2018 for a vol bivouac in the heart of Tadjikistan.

Christina Kolb current paragliding acrobatic champion set off in the summer

<https://www.facebook.com/christina.kolb.fanpage/videos/250641998970533/?t=0>



WE ARE THE ROVER'S

'OFF' ICARE FAVOURITE

We are the Rover's. Producer: Antonin Michaud-Soret. Length 25 minutes. Set in Norway.

After Korea and Scotland, the paramotorists from 'We are the Rovers,' set off to discover Norway. A trip with a very human side, punctuated by laughter and unexpected discoveries round every fiord.

Already reviewed by Voler.info/Free.aero, here's a portfolio of behind the scenes in the film:

<https://www.youtube.com/watch?v=9MRF7kuLrak>



World of XC paragliding



SURF THE LINE

THE PRESS COUPE ICARE

Surf the Line was made by the 'Flying Frenchies'. Producer: Jérémy FREY. Length 52 minutes. France.

Have you ever thought of surfing the sky, of feeling this ultimate sensation of gliding

and freedom? The 'Flying Frenchies,' did it by putting a giant zip wire, 1 km long, 600 m high, dominating the Vercors.

<https://vimeo.com/198027478>



The 2018 edition of the «Icaries du Cinéma» with three viewings per evening (instead of the usual two), showed, once again, the interest in sharing adventures, emotions and the joy of living.

Every year more and more members of the general public take part; every evening was a 'full house'. In addition, it was highly recommended that you buy your ticket in advance to get a place.

With technological advances in filming, along with the technical level of the

producers and the imagination of those flying, we can certainly look forward to many more years of watching fantastic films at the foot of the Dent De Crolles!

In any case, the team from Voler.info/Free.aero will definitely be back for more in 2019...

A special mention went to Leonardo de Vinci!

By Jérôme Bressoulaly (France)



Shanghai in China: with the salaries increasing by 10% per year, they have reached the same level as those in Romania.

PRODUCTION OF PARAGLIDERS AND HARNESSES. RESHORING AND AUTOMATION

Back to Europe: this has become a trend for the production sites of some paraglider manufacturers.

A few years ago, they relocated a large part of their production to eastern Europe and Asia, mainly due to the low salaries. Now, the trend is the opposite, manufactures have started manufacturing in central Europe again. The economists call this 'reshoring', the opposite to 'offshoring,' (relocating abroad).

This has been made possible by technical advances. Up until now, robots were mainly used in heavier industry like car making factories, where they have soldered and glued parts for decades.

TRIBUNE



Guido Reusch

Secretary of The Paragliding Manufacturers Association, the PMA, since September 2016. Former director of the EAPR test laboratory.

The PMA brings together numerous manufacturers and suppliers from the paragliding world. It isn't just involved politically in the regulatory framework of our sport, but also technically and practically from a safety point of view.

From now on, in our magazine, Guido Reusch will be regularly explaining various technical and regulatory aspects.

Some subjects which are a bit dry do actually affect us a lot more than you would think at first glance...

The views in this column don't necessarily reflect the opinion of the editor.

www.p-m-a.info

Now, they have spread into the workshops of smaller companies. Laser cutters and automatic sewing machines are becoming used more frequently.

Modern robots can carry out lots of tasks which, for a long time, could only be done manually. At the same time, the price of the machines is becoming increasingly affordable every year. A laser cutting table with automatic fabric feeder costs less than 30,000 euros. It's a lot less than the average annual cost of a worker.

MADE IN EUROPE THANKS TO AUTOMATION.

Suddenly, 'Made in Europe,' has turned out to be financially viable once again. Manufacturers who have, for a long time, relied on European production have regained their advantage. For a start, the transportation distance is shorter, and the conditions are stable, with moderate price rises. If automation is, from now on, added to that. Not only is the fabric automatically cut and labelled, but also the straps, and more recently, the lines are as well.

At the cutting stage, the staff costs aren't very significant. They sometimes represent less than five percent of the whole cost. It is therefore easier for businesses to opt for countries where the salaries are higher.

According to a study by McKinsey, one European clothing company in three are waiting for automation to consolidate the reshoring trend, because the countries with low salaries have virtually exhausted their potential to reduce costs.

Globalization is losing speed, and this time Donald Trump isn't to blame with his tariffs and sanctions. New high-tech equipment is the reason. They slow down the dynamics of world trade.

THE INCREASE IN SALARIES IN ASIA.

According to experts, German businesses, for example, had already started to 'reshore' back in 2011. When these businesses left China or Asia, it was also because they had underestimated the obstacles there: difficult communication, a long distance to transport by container, or simply insufficient quality.

Now the salaries are also on the increase. The low labour costs in the 1990s was the main argument used by manufacturers the world over.

Workers in China earn, on average, nearly



One manufacturer which has always been 100% made in France: Nervures (Photo: Nervures).



Wings made in Asia travel by boat or plane. This extra cost reduces the economies in labour costs, and shipping by boat takes a long time.

Photo : chrisberic - Fotolia



A laser cutting table in Nova's factory in Hungary. (Photo: Nova).

ten percent more each year, the minimum wage in Shanghai is already nearly the same as in Romania. And today, automation is in the process of completely destroying the advantages in terms of cost.

One thing which is clear: the trend for reshoring is hardly likely to start an employment boom in Europe. Some highly qualified, better paid jobs will be created, but jobs for the 'average worker' won't happen. Only a few simple, manual jobs will remain: splicing unsheathed lines is one of them. No machine has ever fully mastered this type of work.

INTELLIGENT FACTORIES.

In the first high tech businesses, the vehicles find their way about autonomously, transporting fabric and trim from one sewing room to another. There the pieces are identified - they carry a tiny transmitter - and are assembled according to the specifications. Even the smallest quantities can be produced in this type of Smart Factory, and a change of model can take place very quickly.

This type of refinement of flexible production can, of course, also be done in Asia. China had the chance to play this trump card. The People's Republic began to industrialise from the 1990s onwards.

This opportunity wasn't available to other developing countries. They got there too late.



Photo Sascha Burkhardt





Photo: Bruno Lavit

septembre 2019 au 22 Septembre 2019

The next Coupe Icare:
19th - 22nd September 2019



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