ICEPEAK X-ONE

User manual &
Technical data



AIVIUK BEYOND THE GLIDE

Designed to be *number one*

CATEGORIES

COMPETITION

WELCOME

We wish to welcome you to our team and thank you for your confidence in our glider product line.

We would like to share the enthusiasm with which we created this wing and the importance and care we took in the design and manufacture of this new model, in order to offer maximum pleasure on every flight with a Niviuk glider.

The new Icepeak X-One aims to offer unique performance and an unparalleled flying experience. Feel the thrill of flying in a wing designed and prepared to lead the way in high-end competitions.

We are confident you will enjoy flying this wing and will soon discover the meaning of our motto:
“The importance of small details”.

This is the user manual and we recommend you read it carefully.

USER MANUAL

This manual provides you with the necessary information on the main characteristics of your new paraglider.

Whilst it provides information on the wing, it cannot be viewed as an instructional handbook and does not offer the training required to fly this type of paraglider.

Training can only be undertaken at a certified paragliding school and each country has its own system of licensing.
Only the aeronautical authorities of respective countries can determine pilot competence.

The information in this manual is provided in order to warn you against adverse flying situations and potential dangers.

Equally, we would like to remind you that it is important to carefully read all the contents of your new X-ONE manual.

Misuse of this equipment could lead to severe injuries or death. The manufacturers and dealers cannot be held responsible for misuse of the paraglider. It is the responsibility of the pilot to ensure the equipment is used correctly.

CONTENTS

01

CHARACTERISTICS 5

1.1 WHO IS IT DESIGNED FOR? 5
1.2 CERTIFICATION 5
1.3 IN-FLIGHT BEHAVIOR 6
1.4 TECHNOLOGIES, CONSTRUCTION, MATERIALS 6
1.5 ELEMENTS, COMPONENTS 7

02

UNPACKING AND ASSEMBLY 7

2.1 CHOOSING THE RIGHT LOCATION 7
2.2 PROCEDURE 7
2.3 CONNECTING THE HARNESS 7
2.4 HARNESS TYPE 7
2.5 SPEED-BAR 7
2.5.1 SPEED SYSTEM ASSEMBLY 7
2.5.2 CHANGING THE RISER CORDS 8
2.6 INSPECTION AND WING INFLATION ON THE GROUND 8
2.7 ADJUSTING THE BRAKES 8

03

THE FIRST FLIGHT 9

3.1 PREPARATION 9
3.2 FLIGHT PLAN 9
3.3 PRE-FLIGHT CHECK 9
3.4 WING INFLATION, CONTROL AND TAKEOFF 9
3.5 LANDING 9
3.6 PACKING 9

04

IN FLIGHT 10

4.1 FLYING IN TURBULENCE 10
4.2 POSSIBLE CONFIGURATIONS 10
4.3 ACCELERATED FLIGHT 11
4.4 FLYING WITHOUT BRAKE LINES 11
4.5 LINE KNOT(S) IN FLIGHT 11

05

LOSING ALTITUDE 11

5.1 BIG EARS 11
5.2 B3 TECHNIQUE 12
5.3 SPIRAL DIVE 12
5.4 SLOW DESCENT TECHNIQUE 12

06

SPECIAL METHODS 13

6.1 TOWING 13
6.2 ACROBATIC FLIGHT 13

07

CARE AND MAINTENANCE 14

7.1 MAINTENANCE 14
7.2 STORAGE 14
7.3 CHECKS AND INSPECTIONS 14
7.4 REPAIRS 14

08

SAFETY AND RESPONSABILITY 15

09

GUARANTEE 15

10

ANNEXES 16

10.1 TECHNICAL SPECIFICATIONS 17
10.2 COLOURS 18
10.3 MATERIALS 21
10.4 LINE PLAN 22
10.5 RISER PLAN 23
10.6 LINE MEASUREMENTS BY SIZE 24
10.7 TOTAL LINE LENGTH 29
10.8 MINIMUM STRENGTH OF SUSPENSION LINES 31
10.9 MAILLON & PULLEY 32

1. CARACTERISTICS

1.1 WHO IS IT DESIGNED FOR?

The ICEPEAK X-ONE is intended for pilots with passion, the instinct to excel, who have experience and the ambition to feel the excitement of high-level competition with a top performance wing.

A glider without precedent, it is the result of years of research by our R & D team. We aimed to make sure that every detail reaches the maximum of its potential. Basically, a wing that offers much and demands little.

1.2 CERTIFICATION

The X-ONE has been submitted for the CIVL COMPETITION CLASS certification.

All certification tests were performed at the Swiss testing house Air Turquoise.

All sizes passed the load, shock and flight tests.

The load test proved that the wing can withstand the stipulated 8G.

The shock test proved that the wing can resist 1000 daN of force.

The flight test resulted in the following certification for all X-ONE sizes:

CCC
CCC

We recommend that only pilots who are familiar with gliders of this certification or above fly this paraglider.

Only the aeronautical authorities of respective countries can determine pilot competence.

We recommend pilots read the flight test report carefully, especially the comments of the test pilot. The report contains all the necessary information on how the paraglider reacts during each of the tested manoeuvres.

It is important to note that different size wings will react differently during manoeuvres. Even within the same size, at maximum or minimum load, the behaviour and reactions of the wing may vary.

Description of flight characteristics of CCC paragliders:

Paragliders with demanding and unique flight characteristics with potentially violent reactions in turbulence and to pilot errors. Normal flight recovery requires precise pilot intervention.

· Description of the skills required by the pilot to fly a CCC wing:

For pilots trained in recovery techniques, who fly very actively, have significant experience of flying in turbulent conditions and who accept the consequences of flying with this type of wing.

For further information on the flight test and the corresponding certification, please see the final pages of this manual or see or visit the Downloads section.



1.3 IN-FLIGHT BEHAVIOUR

Niviuk developed this wing by adopting very specific goals: to improve performance, excellent handling; to facilitate more control for the pilot.

To increase performance while maintaining the highest level of safety. To ensure that the wing transmits the maximum feedback in an understandable and comfortable way so that the pilot can focus on piloting and enjoying the flight. And, with smooth handling, take advantage of all favourable conditions.

In all aspects of flight, the wing is very solid and stable. The glide is smooth, even when fully accelerated. When gliding, it has an excellent sink rate and the profile remains stable. Improved turn precision means handling is less physical and provides better feedback. Turning is intuitive, precise and requires less physical effort. Inflating the wing is much easier and gentler, without overshooting.

Flying this wing is very intuitive, with clear, usable feedback about the airmass. It responds to the pilot's inputs effectively and even in thermic and turbulent conditions it remains stable and solid.

The X-ONE flies efficiently. It enters thermals with sufficient speed to centre in the lift and climbs progressively. The handling is responsive and effective for even more flying pleasure under an exciting wing of extraordinary quality. under a quality wing of extraordinary workmanship.
It is lightweight, even lighter in flight and easy to pilot, with outstanding turbulence buffering and a surprising range of speed for incredible glides.

1.4 TECHNOLOGIES, CONSTRUCTION, MATERIALS

The paraglider has all the technological innovations used on other Niviuk gliders and is built with the most careful selection of current materials. It has all the current technology and accessories available to improve pilot comfort whilst increasing safety and performance.
In the design of all Niviuk products the team aims to ensure development and continuous improvement. The technologies developed in recent years have allowed us to develop greater, better wings. It is in this context that we would like to introduce the technologies included in this new model:

RAM Air Intake - The system is characterised by the arrangement of the air inlets, to ensure optimal maintenance of internal pressure across the the whole range of angles of attack.

The result? Having greater internal pressure means better tolerance of turbulence, greater consistency of the profile shape across the speed range; excellent handling at low speed is achieved by allowing the pilot to extend the braking limit, there is a lower risk of collapse and consequently, greater control and safety.

The application of RAM technology ensures that the internal pressure of the wing is optimal and that the profile maintains its ideal shape in all flight conditions.

TNT Titanium Technology - a revolutionary technique using titanium. Using Nitinol in the internal construction provides a more uniform profile and reduces the weight to gain efficiency in flight. Nitinol provides the highest level of protection against deformation, heat or breaks. Nitinol now features in all our wings.

The distribution of the Nitinol rods on the leading edge has been simplified and optimised to maintain the glider's lightness, durability and compactness when packing.

SLE Structured Leading Edge - SLE is the application of Nitinol rods in the leading edge. This technology provides increased strength and stability by maintaining the shape of the aerofoil throughout all phases of flight. This increases performance, efficiency and stability, absorbs turbulence better and makes the wing much more durable over time.

3DP Pattern Cut Optimization - this involves placing the fabric of each panel in one direction only, taking as a reference its location on the leading edge. It has been proved that, if the cloth pattern is correctly aligned to the direction of the load axes, the material deforms much less flight after flight, so the leading edge keeps its shape better and is much more durable over time.

Over the years, the design of our paragliding and paramotoring wings has evolved a lot, with a positive and specific advancement of the leading edge.

3DL 3D Leading Edge - this means adjusting the material of the leading edge to avoid ballooning and the creases that form in this curved area of the wing. Specifically, the leading edge is divided into "sub-panels" sewn into each of the cells at the front of the glider. As a result, the tension of the leading edge cloth is perfectly uniform, increasing the performance and durability of the glider.

Structured Trailing Edge (STE) - optimises the profile without deforming it. The circulation of the air is more fluid, ensuring a cleaner airflow. When changing the angle of attack or when accelerated, the profile remains more uniform and the after braking, the wing returns to trim more progressively, faster and more actively.

DRS Drag Reduction Structure - the DRS aims to reduce the adverse pressure gradient and drag by optimising the aerodynamic shape of the wing. Its application makes the airflow direction much more progressive at the trailing edge. This increases performance without reducing safety and control of the wing.

The mini-ribs are integrated directly into the trailing edge, with special slots to incorporate them into the wing seam, achieving a cleaner profile, eliminating external seams and protecting them from wear and tear when in contact with the ground.

The use of these technologies is a big technological leap forward in building wings and a big improvement in flight comfort.

For the construction process of the X-ONE we use the same criteria, quality controls and manufacturing processes as in the rest of our range. From Olivier Nef's computer to fabric cutting, the operation does not allow for even a millimetre of error. The cutting of each wing component is performed by a rigorous, extremely meticulous, automated computer laser-cutting robotic arm. This program also paints the guideline markers and numbers on each individual fabric piece, thus avoiding errors during this delicate process.

The jigsaw puzzle assembly is made easier using this method and optimises the operation while making the quality control more efficient. All Niviuk gliders go through an extremely thorough and detailed final inspection. The canopy is cut and assembled under strict quality control conditions, facilitated by the automation of this process.

Every wing is individually checked with a final visual inspection.

The fabric used to manufacture the glider is light, resistant and durable. The fabric will not experience fading and is covered by our warranty. All lines are made from unsheathed Technora and Dyneema in the upper brake line galleries.

The line diameter has been calculated depending on the workload and aims to achieve the required best performance with the least drag.

The lines are semi-automatically cut to length and all the sewing is completed under the supervision of our specialists.

Every line is checked and measured once the final assembly is concluded.

Each glider is packed following specific maintenance instructions as recommended by the fabric manufacturer.

Niviuk gliders are made of premium materials that meet the requirements of performance, durability and certification that the current market demands.

Information about the various materials used to manufacture the wing can be viewed in the final pages of this manual.

1.5 ELEMENTS, COMPONENTS

The X-ONE is delivered with a series of accessories that will greatly assist you in the maintenance of your paraglider:

- An inner bag to protect the wing during storage and transport.
- An adjustable compression strap to compress the inner bag and reduce its volume.
- A repair kit with self-adhesive Ripstop tape and spare O-rings to protect the maillons.
- A bag to protect the risers.
- An NKare Bag that makes optimal packing and transportation of the X-ONE easy.
- A Kargo bag. It is not included in the pack, but we recommend to get it. This bag is large enough to hold all equipment comfortably and with plenty of space.

2. UNPACKING AND ASSEMBLY

2.1 CHOOSING THE RIGHT LOCATION

We recommend unpacking and assembling the wing on a training hill or a flat clear area without too much wind and free of obstacles. It will help you to carry out all the recommended steps required to check and inflate the X-ONE.

We recommend the whole installation procedure is supervised by a qualified professional instructor or official dealer. Only they can address any doubts in a safe and professional way.

2.2 PROCEDURE

Take the glider out of the rucksack, open and unfold it on the ground with the lines positioned on the undersurface, oriented in the direction of inflation. Check the cloth and lines are undamaged and all maillons connecting the lines and risers are locked. Identify, and if necessary untangle, the A, A', A'', B and brake lines and corresponding risers. Make sure that there are no knots.

2.3 CONNECTING THE HARNESS

The X-ONE risers are colour-coded.

- Right: green
- Left: red

This colour-coding makes it easier to connect the wing to the correct side and helps prevent pre-flight errors.

Correctly connect the risers to the attachment points so that the risers and lines are correctly ordered and free of twists. Check that the IKS and carabiners are properly fastened and securely locked.

2.4 HARNESS TYPE

The X-ONE can be flown with all current harness types. We recommend the setting the chest strap to the distance specified in the certification report - this will vary depending on size. See the certification report.

Care should be taken with the chest strap setting, as the distance of the chest strap setting will affect the handling of the glider. If the chest strap is too wide, it allows greater feedback but this carries the risk of affecting the stability of the wing.

If the chest strap is set too tightly, the wing feels more solid, but there is a loss of feedback and a risk of twisting in the case of a violent asymmetric collapse.

2.5 SPEED-BAR INSTALLATION

The speed-bar is a means of temporary acceleration by changing the flow over the profile. The speed system comes pre-installed on the risers and is not modifiable as it conforms to the measurements and limits stipulated in its certification.

The X-ONE includes a speed system with maximum travel depending on its size (see Full speed-bar).
The speed system is engaged when the pilot pushes the speed-bar (not included as standard with this glider model) with their feet. The pilot must fit and install the speed-bar and connect it to the risers (see 2.5.1: Speed system assembly)

The speed system uses an action/reaction system. Released, the speed-bar is set to neutral. When the bar is pushed using the feet, the wing accelerates. The speed can be regulated by varying the pressure on the bar. Once the pressure on the bar is released, the speed system returns to the neutral setting.

The speed system is efficient, sensitive and precise. The pilot can use the system whenever they want during the flight. In the neutral position the glider will fly at the standard speed and glide. Using full speed-bar, the wing will fly at maximum speed, but the glide will be adversely affected.

- Released speed-bar: The A, A', A'' and B risers remain aligned.
- Maximum speed-bar setting as stipulated by the CCC classification standards: 14 cm

(!) PLEASE NOTE! The use of the speed system results in changes to the speed and reactions of the wing. For more information, please see the certification report.

2.5.1 SPEED SYSTEM ASSEMBLY

The speed-bar consists of the bar that the pilot pushes with their feet, as well as the two cords that connect it to the speed system components on the risers. Once you have chosen the type of speed-bar you prefer, you must install it. Some considerations:

- The pilot should use the type of speed-bar they consider appropriate, depending on the type of harness, personal preferences, etc.

- The speed-bar is detachable to facilitate its connection and/or disconnection to the risers as well as subsequent adjustment.

- To connect it to the harness, please follow the instructions of the harness manufacturer. The majority of harnesses have a speed system pre-installed.

- The standard connection of the speed-bar to the speed system is via Brummel hooks, where two slots in the hooks are interlocked, making their connection/disconnection easy. However, any connection system that is safe may be used.

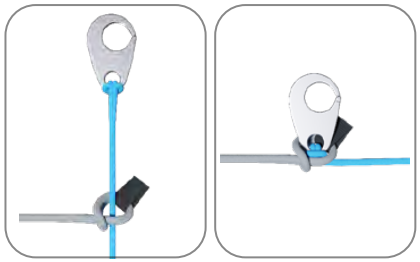


Diagram 1. Speed-bar connection by means of the Brummel hook.

2.5.2 CHANGING THE RISER CORDS

In spite of the speed system having pulleys with bearings to reduce friction to a minimum, the frequency with which the speed-bar is used causes the cord to wear and you may need to replace them.

In all Niviuk gliders the speed system cords on the risers are completely removable and easily replaceable. You can use the Brummel hooks, not use them, remove them, use another type of connector, etc. It is even possible to fix the speed-bar cords directly to the speed system on the risers. This last option makes the connection / disconnection more laborious, but means the cord has maximum travel without obstructions or restrictions which is very useful for some models of harnesses.

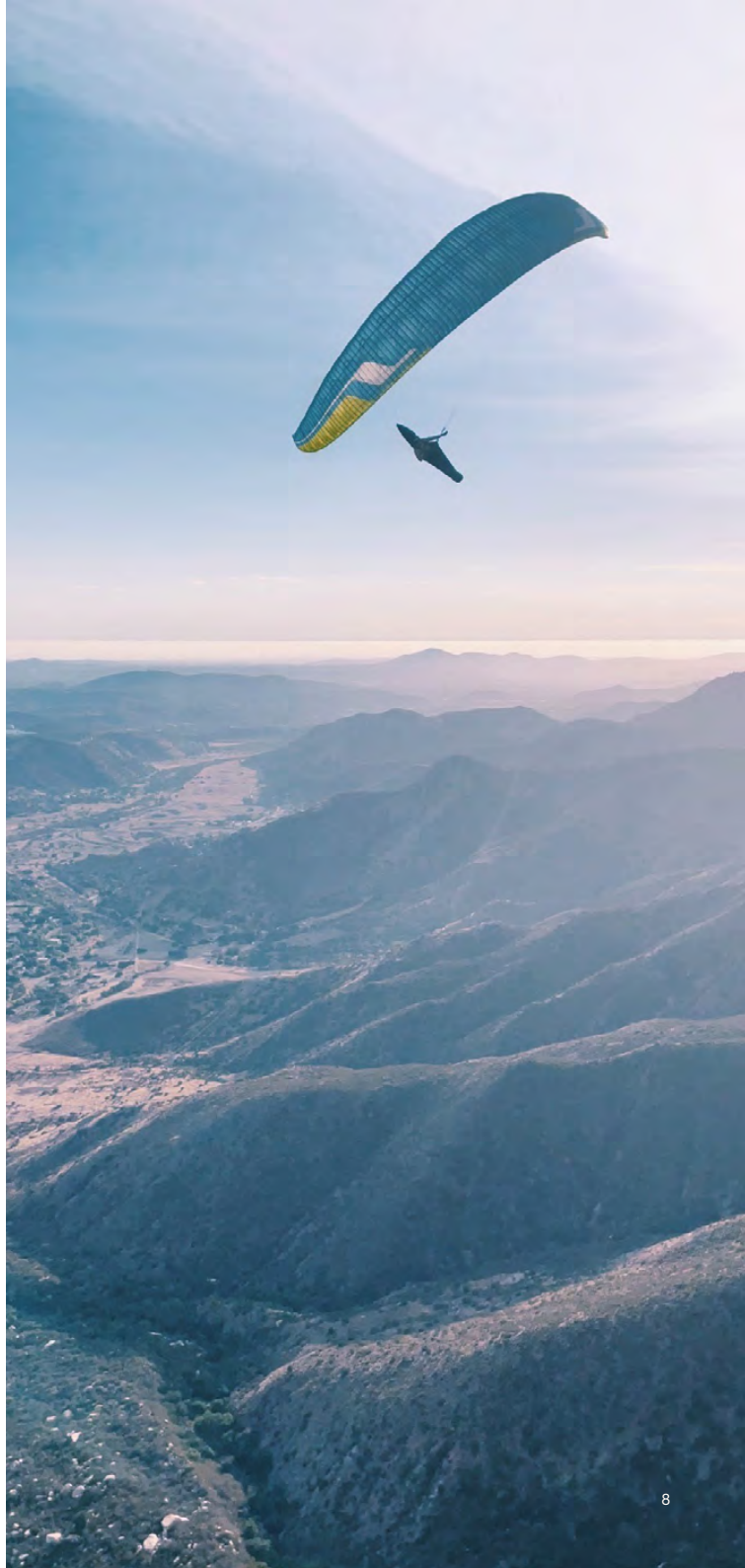
2.6 INSPECTION AND WING INFLATION ON THE GROUND

After your gear has been thoroughly checked and the weather conditions deemed favourable for flying, inflate your X-ONE as many times as necessary to familiarise yourself with its behaviour. The X-ONE inflates easily and smoothly. Excessive energy is not necessary and the wing will inflate with a little pressure from the body when you move forward. This may be assisted by using the A-lines. Do not pull on them; just accompany the natural rising movement of the wing. Once the wing is inflated to the overhead position, appropriate control with the brakes will be sufficient to hold it there.

2.7 ADJUSTING THE BRAKES

The length of the main brake lines is adjusted at the factory and conform to the length stipulated during certification. However, the length can be changed to adapt to the pilot's flying style. In any case, we recommend flying for a while using the default factory set line length before making any adjustment. It will enable you to become more familiar with the X-One and its unique flying characteristics. If you then decide to change the length of the brake lines, untie the knot, slide the line through the brake link to the desired length, and re-tie the knot so that it is tight. Only qualified personnel should carry out this adjustment. You must ensure that the modification does not affect the trailing edge and slow the glider down without pilot input. Both brake lines should be symmetrical and of the same length. We recommend using a clove hitch or bowline knot.

When changing the brake length, it is necessary to check that they do not engage when the speed-bar is used. When we accelerate, the glider rotates over the C-riser and the trailing edge elevates. It is important to check that the brake is adjusted to take into consideration this extra distance during acceleration. With this profile deformation there is a risk of generating turbulence and causing a frontal or asymmetric collapse.



3. THE FIRST FLIGHT

3.1 PREPARATION

Repeat the procedures detailed in section 2 UNPACKING AND ASSEMBLY to prepare your equipment.

3.2 FLIGHT PLAN

Planning a flight before taking off to avoid possible problems later is always a good idea.

3.3 PRE-FLIGHT CHECK

Once ready, but before taking off, conduct another equipment inspection. Conduct a thorough visual check of your gear with the wing fully open, the lines untangled and properly laid out on the ground to ensure that all is in working order. Be certain the weather conditions are suited to your flying skill level.

3.4 WING INFLATION, CONTROL AND TAKEOFF

Smoothly and progressively inflate the wing. The X-ONE inflates easily and does not require additional input. The X-ONE does not have the tendency to overfly the pilot. It is a straight forward exercise leaving enough time for the pilot to decide whether to accelerate and take off or not.

If the wind permits, we recommend a reverse launch, as this allows a better visual inspection of the wing during inflation. In “strong” winds, the X-ONE is especially easy to control using this launch technique. Winds of 25 to 30 km/h are considered strong for paragliding.

Choose an appropriate location facing the wind. Position the X-ONE in a crescent configuration to facilitate inflation. A clean wing layout will ensure a trouble-free take off.

3.5 LANDING

The X-ONE lands excellently, it converts the wing speed into lift at your demand, allowing an enormous margin of error. Wrapping the brake lines around your hand to get greater braking efficiency is not necessary.

3.6 PACKING

The X-ONE has a complex leading edge, manufactured using a variety of different materials and it must be packed carefully. A correct folding method is very important to extend the useful life of your paraglider.

It should be concertina-packed, with the leading edge reinforcements flat and the flexible rods stacked one on top of the other. This method will keep the profile in its original shape and protect the integrity of the wing over time. Make sure the reinforcements are not bent or folded. It should not be folded too tightly to avoid damage to the cloth and/or lines.

At Niviuk we have designed the NKare Bag, a bag designed to assist you with rapid packing which helps maintain the integrity of the leading edge and its internal structures in perfect condition.

The NKare Bag guides you through the folding process, allowing you to concertina pack the wing with each rod on top of the other and then fold the wing as required. This folding system ensures that both the fabric and the reinforcements of the internal structure are kept in perfect condition.



4. IN FLIGHT

We recommend that you read the certification test report.

The report contains all the necessary information on how the X-ONE reacts during each of the tested manoeuvres.

It is important to point out that the appropriate response to each adverse manoeuvre can vary from size to size; even within the same size at maximum or minimum load the behaviour and reactions of the wing may vary.

Having the knowledge that the testing house provides through the test report is fundamental to learning how to deal with possible situations.

To become familiar with the manoeuvres described below, we recommend practising within the auspices of a licensed training outfit.

4.1 FLYING IN TURBULENCE

The X-ONE has an excellent profile to deal with incidents; it is very stable in all conditions and has a high degree of passive safety, even in turbulent conditions.

All paragliders must be piloted for the prevailing conditions and the pilot is the ultimate safety factor.

We recommend active flying in turbulent conditions, always taking measures to maintain control of the wing, preventing it from collapsing and restoring the speed required by the wing after each correction.

Do not correct the glider (braking) for too long in case this provokes a stall. Whenever necessary, control a situation, react to it and then re-establish the required speed.

4.2 POSSIBLE CONFIGURATIONS

In spite of the X-ONE's profile stability, strong turbulent air may cause the wing to collapse asymmetrically in very strong turbulence, especially if the pilot is unable to fly actively and prevent the collapse. In this case the glider conveys a loss of pressure through the brake lines and the harness. To prevent the collapse from happening, pull the brake handle corresponding to the affected side of the wing. It will increase the incidence of the wing (angle of attack). If the collapse does happen, the X-ONE will not react violently, the turning tendency is gradual and easily controlled. Weight-shift toward the open, flying side (the opposite side of the collapse) to keep the wing flying straight, while applying light brake pressure to that side if necessary. Normally, the collapsed side of the wing should then recover and reopen by itself. If it does not, then pull the brake handle on the collapsed side decisively and quickly all the way (100%) down. You may have to repeat this pumping action to provoke the re-opening of the deflated glider side. Do not over-brake or slow down the flying side of the wing (control the turn). Once the collapsed side is open make sure you return to the default flying speed.

Frontal collapse

Due to the X-ONE's design, in normal flying conditions frontal collapses are extremely unlikely. The wing's profile has great buffering abilities when dealing with extreme incidence changes. A frontal collapse may occur in strong turbulent conditions, entering or exiting powerful thermals or when lacking experience using the accelerator/ speed-bar without adapting to the prevailing conditions. Frontal collapses usually re-inflate without the glider turning, but a symmetrically applied quick braking action with a quick deep pump of both brakes will accelerate the re-inflation if necessary. Release the brake lines immediately to return to default glider air speed.

Negative spin

A negative spin does not conform to the X-ONE's normal flight behaviour. Certain circumstances however, may provoke a negative spin (such as trying to turn when flying at very low air speed whilst applying a lot of brake). It is not easy to give any specific recommendation about this situation other than quickly restoring the wing's default air speed and angle of attack by progressively reducing the tension on the brake lines. The normal wing reaction will be to have a lateral surge on the re-accelerated side with a rotation not greater than 360º before returning to default air speed and a straight flight path trajectory.

Parachutal stall

The possibility of entering or remaining in a parachutal stall have been eliminated from the X-ONE.

A parachutal stall is virtually impossible with this wing. If it did enter into a parachutal stall, the wing loses forward motion, becomes unstable and there is a lack of pressure on the brake lines, although the canopy appears to be fully inflated. To regain normal air speed, release brake line tension symmetrically and manually push on the A-lines or weight-shift your body to any side WITHOUT PULLING ON THE BRAKE LINES.

Deep Stall

The possibility of the X-ONE stalling during normal flight is very unlikely. It could only happen if you are flying at a very low air speed, whilst over-steering or performing dangerous manoeuvres in turbulent air.

To provoke a deep stall, the wing has to be slowed down to its minimum air speed by symmetrically pulling the brake lines all the way (100%) down until the stall point is reached and held there. The glider will first pitch rearward and then reposition itself overhead, rocking slightly, depending on how the manoeuvre was done.

When entering a stall, remain clear-headed and ease off the brake lines until reaching the half-way point of the total the brake travel. The wing will then surge violently forward and could reach a point below the pilot. It is most important to maintain brake pressure until the glider has returned to its default overhead flying position.

To resume normal flight conditions, progressively and symmetrically release the brake line tension to regain air speed. When the wing reaches the overhead position, the brakes must be fully released. The wing will then surge forward to regain full air speed. It is important not to use too much brake at that moment, since the paraglider needs to regain speed to exit the stall. If you have to control a possible frontal collapse, briefly pull both brake handles down to bring the wing back up and release them immediately while the glider is still in transition to reposition itself overhead.

Cravat

A cravat may happen after an asymmetric collapse, when the end of the wing is trapped between the lines. Depending on the nature of the tangle, this situation could rapidly cause the wing to spin. The corrective manoeuvres to use are the same as those applied in case of an asymmetric collapse: control the turn/spin by applying tension on the opposite brake and weight shift opposite to the turn. Then locate the stabilo line (attached to the wing tip) trapped between the other lines. This line has a different colour and is located on the outside position of the B-riser.

Pull on this line until it is taught, as it should help undo the cravat. If ineffective, fly down to the nearest possible landing spot, controlling the direction with both weight shift and the use of the brake opposite to the tangled side. Be cautious when attempting to undo a tangle

while flying near terrain or other paragliders; it may not be possible to continue on the intended flight path.

Over-controlling

Most flying problems are caused by wrong pilot input, which then escalates into a cascade of unwanted and unpredicted incidents. We should note that the wrong inputs can lead to loss of control of the glider. The X-ONE was designed to recover by itself in most cases. Do not try to over-correct it!

Generally speaking, the reactions of the wing, which are caused by too much input, are due to the length of time the pilot continues to over–control the wing. You have to allow the glider to re-establish normal flying speed and attitude after any type of incident.

4.3 ACCELERATED FLIGHT

The X-ONE's profile was designed for stable flight throughout its entire speed range. The speed-bar can be used in strong winds or significant sink.

When accelerating the wing, the profile becomes more sensitive to turbulence and closer to a possible frontal collapse. If a loss in internal wing pressure is felt, tension on the speed-bar should be reduced to a minimum and a slight pull on the brake lines is recommended to increase the wing's incidence angle. Remember to re-establish the air speed after correcting the angle of attack.

It is NOT recommended to accelerate near obstacles or in very turbulent conditions. If necessary, constantly adjust the movements and pressure on the speed-bar whilst doing the same to the brake lines. This balance is considered to be 'active piloting'.

4.4 FLYING WITHOUT BRAKE LINES

If, for any reason at all, the X-ONE's brake lines become disabled in flight, it will become necessary to pilot the wing with the C-risers and weight shifting until landing. The C-risers steer easily because they are not under much tension, however you will need to be careful and not handle them too heavily in case this causes a stall or negative spin. The wing must be flown at full speed during the landing approach, and the C-risers will have to be pulled symmetrically all the way down shortly before contact with the ground. This braking method is not as effective as using the brake lines, and hence the wing will land with a higher ground speed.

4.5 LINE KNOT(S) IN FLIGHT

The best way to avoid knots and tangles is to thoroughly inspect the lines as part of a systematic pre-flight check. If a knot is spotted during the take off phase, immediately abort the launch sequence and stop.

If inadvertently taking off with a knotted line, the glider drift will need to be compensated by weight-shifting to the opposite side of the wing and applying a slight brake pull to that side. Gently pull the brake line to see if the knot can be undone or try to locate the problem line. Try pulling it to see if the knot can be undone. Beware of trying to clear a knotted line or untangle a line in flight when close to the terrain. If the knot is too tight and cannot be undone, carefully and safely fly to the nearest landing zone. Be careful: do not pull too hard on the brake handles because there will be an increased risk of stalling the wing or entering a negative spin. Before attempting to clear a knot, make sure there are no other pilots flying in the vicinity.



5. LOSING ALTITUDE

Knowledge of different descent techniques could become vital in certain situations. The most suitable descent method will depend on the particular situation.

5.1 EARS

Big ears is a moderate descent technique, able to increase the sink rate to –3 or –4 m/s and reduces the ground speed by 3 to 5 km/h. The angle of attack and effective wing-loading will also increase due to the smaller surface area of the wing.

Standard technique
To perform the 'Big ears' manoeuvre, take the outermost line on each A-riser and simultaneously, smoothly pull them outward and downward. The wingtips will fold in.

To re-establish forward speed and the correct angle of attack, accelerate once the ears are pulled.

Keep the ears pulled in until you have lost the desired altitude.

Let go of the lines to re-inflate the tips automatically. If they do not, try progressively pulling one brake then the other. Asymmetric reopening is recommended in order to avoid compromising the angle of attack, particularly flying near the ground or in turbulent conditions.

BEWARE OF THE RISK OF STALLING!

When we are holding the tips down with the "3C3" lines, it is possible to accidentally affect the brakes. This can obviously lead to a significant speed decrease, since such action slows the wing down.
In paragliders with a very pronounced arc, pulling big ears means an increase in drag. On a very arched wing, the ears do not fold, they just hang. The increase of drag is more pronounced than on wings with a less pronounced arc.
The X-ONE is designed with little chord, which is good in normal flight conditions. However, this same damping is what can cause us to have problems to regain normal flying speed after a high increase of the angle of attack and the added drag of the ears.
These particularities, together with turbulent thermic conditions, could cause an unintentional stall.

The solution: big ears may still be applied but you must be fully aware of the above-mentioned points and act accordingly. To avoid the stall,

simply use half speed-bar (this is sufficient) to increase the speed and decrease the angle of incidence. This should allow you to maintain sufficient speed to prevent the stall. Take care not to pull the brakes while making the ears as this will make a stall more likely!

5.2 B3 TECHNIQUE

On the new generation paragliders like the X-ONE, the application of big ears can create a high degree of trailing edge turbulence. In addition, with the length of the chord and the arc of the wing, the ears have a tendency to “flap”, increasing the turbulence and causing the paraglider to lose too much airspeed, making it necessary for the pilot to recover it, either using the the speed-bar or releasing the ears.

This new rapid descent technique was first discovered by our Niviuk team pilots in 2009 while flying a competition prototype wing, which, because of its line plan and high aspect ratio would not allow big ears to be applied. In fact, big ears on 2-liner wings can often prove difficult. With the current 2 or 3-liner wings, the inability to pull big ears, or the risk involved in doing so, concerns many pilots who want to have a controlled rapid descent technique. For the above reasons we recommend using the 3C3 line.

This technique easily increases the descent rate without causing problems and without the risk of causing a collapse while maintaining high speed.

How? Locate the 3C3 line on your risers and, as you would when applying big ears, simply pull down firmly and smoothly until you see both wingtips drop back slightly. The forward speed of the glider speed will then reduce slightly, quickly stabilise and then increase. You will then experience a descent rate of around 5-6 m/s.

We recommend the application of the speed-bar whilst using this technique. Controlled turning of the wing can easily be maintained by weight shifting, exactly the same as you would with big ears. During this manoeuvre, the first sensation is a decrease in relative wind and a slight backwards inclination of the wing, as if going backwards.

To exit the manoeuvre release the lines as you would with big ears, control the pitch and the wing will quickly adopt normal flight. This new technique allows a comfortable and controllable rapid descent without the risk of experiencing a cravat. It is very comfortable and makes turning simple. We advise you to first try this technique in smooth conditions with sufficient altitude above appropriate terrain.
This is a new controlled descent technique that only needs a little practise to be executed with total comfort and effectiveness.

5.3 SPIRAL DIVE

This is a more effective way to rapidly lose altitude. Beware that the wing will experience and be subjected to a tremendous amount of descending and rotating speed (g-force), which can cause a loss of orientation and consciousness (blackout). This manoeuvre must therefore be done gradually to increase one’s capacity to resist the g-force exerted on the body. With practise, you will fully appreciate and understand it. Only practise this manoeuvre at high altitude and with enough ground clearance.

To start the manoeuvre, first weight shift and pull the brake handle located on the inner side of the turn. The intensity of the turn can be controlled by braking slightly using the outer brake handle.

A paraglider flying at its maximum rotating speed can reach –20 m/s, or the equivalent of a 70 km/h vertical descent, and will stabilise in a spiral dive from 15 m/s onwards.

Good enough reasons to familiarise yourself with the manoeuvre and understand how to exit it.

To exit this manoeuvre, the inner brake handle (down side of the turn) must progressively be relaxed while momentarily applying tension to the outer brake handle opposite to the turn. The pilot must also weight shift and lean towards the opposite side of the turn at the same time.

The exit should be performed gradually and smoothly so that the changes in pressure and speed can be noted.
When exiting the spiral, the glider will briefly experience an asymmetrical acceleration and dive, depending on how the manoeuvre was carried out.

Practise these manoeuvres at sufficient altitude and with moderation.

5.4 SLOW DESCENT TECHNIQUE

This technique allows descent without straining the wing or taxing the pilot. Glide normally while searching for descending air and begin to turn as if climbing in a thermal, but with the intention to sink.

Common sense has to be used to avoid dangerous areas of rotor when looking for descending air. Safety first!



6. SPECIAL METHODS

6.1 TOWING

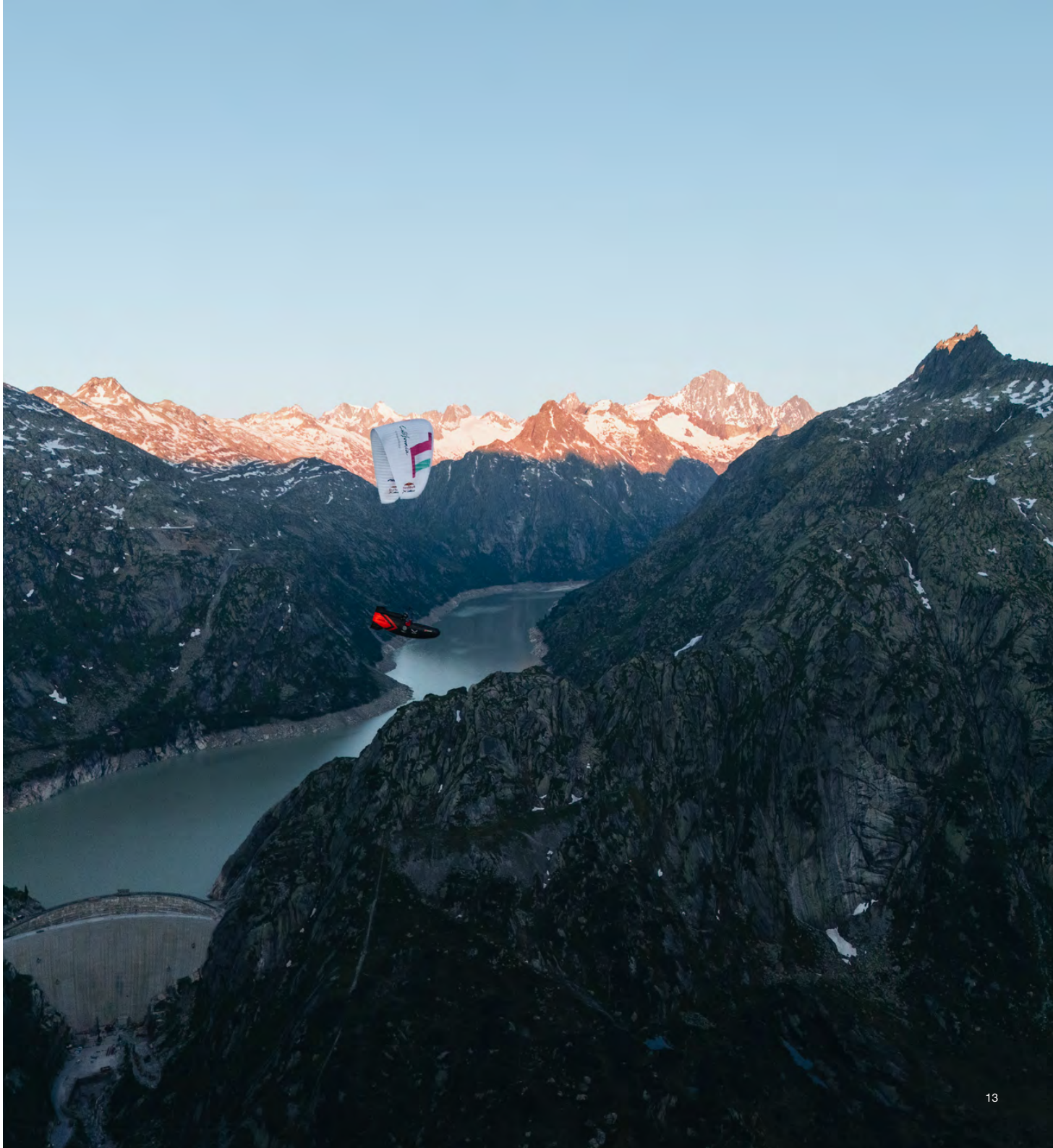
The X-ONE does not experience any problem whilst being towed. Only qualified winch personnel should handle the certified equipment to carry out this operation. The wing must be inflated similarly as during a normal takeoff.

It is important to use the brakes to correct the flight path alignment, especially if the glider begins to turn. Since the wing is subject to a slow airspeed and with a high positive angle of attack, we must make any corrections with a high degree of feel and delicacy, in order to avoid a stall.

6.2 ACROBATIC FLIGHT

Although the X-ONE was tested by expert acrobatic pilots in extreme situations, it was not designed for it. We do NOT recommend using this glider for acrobatic flying!

We consider acrobatic flights to be any form of piloting different than standard flights. Learning aerobatic/acrobatic manoeuvres should be conducted under the supervision of qualified instructors within a school environment and over water with all safety/rescue elements in place. Centrifugal forces as high as 4 to 5 g can be exerted on the body and wing during extreme manoeuvres.



7. CARE AND MAINTENANCE

7.1 MAINTENANCE

Careful maintenance of your equipment will ensure continued top performance. Apart from the general checks, we recommend actively maintaining your equipment.

A pre-flight check is obligatory before each flight. If there is any damage to the equipment or you suspect any areas of the wing are susceptible to wear, you should inspect these and act accordingly.

Niviuk we are firmly committed to make technology accessible to all pilots. Therefore, our wings are equipped with the latest technological advances gained from the experience of our R&D team. Thanks to these new technologies, paragliders are gaining more safety and performance, which requires greater care of the materials.

(!) IMPORTANT: it is critical to avoid any kind of impact or dragging the leading edge on the ground. This part is reinforced with very durable and strong Nitinol rods that can be easily replaced. Dragging and/or hitting the leading edge can cause serious damage to the fabric, which is much more complicated and costly to repair.

The fabric and the lines do not need to be washed. If they become dirty, clean them with a soft damp cloth, using only water. Do not use detergents or other chemicals.

If your wing is wet from contact with water, place it in a dry area, air it and keep it away from direct sunlight.

Direct sunlight may damage the wing's materials and cause premature aging. After landing, do not leave the wing exposed to the sun. Pack it properly and stow it away in its backpack.

If you fly in sandy areas, avoid getting sand in the cells or down into the trailing edge. At the end of the flight, empty any sand that is in your wing. The openings at the end of the wingtips make this much easier.

If your wing is wet from contact with salt water, immerse it in fresh water and dry it away from direct sunlight.

7.2 STORAGE

It is important for the wing to be correctly folded when stored. Keep it in the in a cool, dry place away from solvents, fuels, oils.

Do not leave your gear inside a car boot, as cars left in the sun can become very hot. A rucksack can reach temperatures up to 60ºC.

Weight should not be laid on top of the equipment. It is very important to pack the wing correctly before storage.

In case of long-term storage, it is advisable, if possible, that the wing is not compressed and it should be stored loosely without direct contact with the ground. Humidity and heating can have an adverse effect on the equipment.

7.3 CHECKS AND INSPECTIONS

In accordance with its certification, the X-ONE must be periodically serviced. An inspection must be scheduled every 100 flying hours or every 24 months, whichever comes first.

We strongly recommend that any repairs should be performed at a specialist repair shop by qualified personnel.

This is the only way to guarantee the airworthiness and continued certification of your X-ONE.

A thorough pre-flight check must be performed before every flight.

Checking unsheathed lines and risers

The X-ONE is fitted with unsheathed lines. Their durability conforms to unsheathed line standards. Their strength is guaranteed and their resistance to UV is one of the highest in this type of lines. However, using these lines means there is a requirement to maintain the trim of your X-ONE within the stipulated ranges.

We recommend checking the lines after the first +/- 30 flying hours.

Why is this necessary?
Thanks to our research and experience acquired over time by our R&D team, we are capable of predicting how lines will perform.

By following the stipulated maintenance schedule and inspections the wing remains at optimum trim without any loss of performance.

The maintenance carried out on each wing will be different depending on the conditions of each flying area, climate, temperature, humidity, type of terrain, wing load, etc.

With reference to the so-called loops, some models are delivered with loops already made. To adjust the trim these can be loosened or readjusted.

The X-One comes as standard with a loop on the A' limiter line, allowing some additional length to be released if the limiter sorhtens over time.

The lines and risers lengths should be checked and must match to the dimensions specified in this manual.

A wing should not be trimmed according to the measurements copied from another wing of the same type. Each trim setting is individual to each wing, and is determined after measurements and subsequent analysis by specialised personnel.

7.4 REPAIRS

We recommend any inspection or repair is performed by a Niviuk professional in our official workshop.

Any modification of the glider made in an unauthorised workshop will invalidate the guarantee of the product. Niviuk cannot be held responsible for any issues or damage resulting from modifications or repairs carried out by unqualified professionals or who are not approved by the manufacturer.

8. SAFETY AND RESPONSIBILITY

It is well known that free-flying with a paraglider is considered a high-risk sport, where safety depends on the person who is practicing it.

Incorrect use of this equipment may cause severe, life-changing injuries to the pilot, or even death. Manufacturers and dealers cannot be held responsible for your decisions, actions or accidents that may result from participating in this sport.

You must not use this equipment if you have not been properly trained to use it. Do not take advice or accept any informal training from anyone who is not properly qualified as a flight instructor.

9. GUARANTEE

The equipment and components are covered by a 2-year warranty against any manufacturing defect.

The warranty does not cover misuse of the equipment.

Any modification of the paraglider or its components invalidates the guarantee and its certification.



ANNEXES

10. ANNEXES

10.1 Technical specifications

			20	22	24	25	26
Cells	Number		115	115	115	115	115
Aspect Ratio	Flat		8	8	8	8	8
	Projected		6,16	6,16	6,16	6,16	6,16
Area	Flat	m2	20	21,7	23	24,6	26,4
	Projected	m2	17,07	18,52	19,63	20,99	22,53
Span	Flat	m	12,64	13,17	13,56	14,02	14,53
Chord	Max	m	1,98	2,06	2,12	2,19	2,27
Lines	Total	m	197	205	211	219	227
	Main		1+1+1/3	1+1+1/3	1+1+1/3	1+1+1/3	1+1+1/3
Risers	Number	2+1	A+A'+A''/B	A+A'+A''/B	A+A'+A''/B	A+A'+A''/B	A+A'+A''/B
	Speed-bar	mm	140	140	140	140	140
Glider weight		kg	5,90	6,06	6,32	6,65	6,91
Total weight in flight	Min-Max	kg	80-95	90-105	98-112	108-120	118-133
Weight in flight opt.			88-91	100-101	108-109	117-119	128-130
Certification			CCC	CCC	CCC	CCC	CCC

The total weight of the wing may differ ±2% due to variations in the weight of the fabric supplied by the manufacturers.

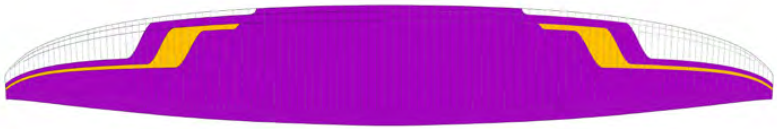




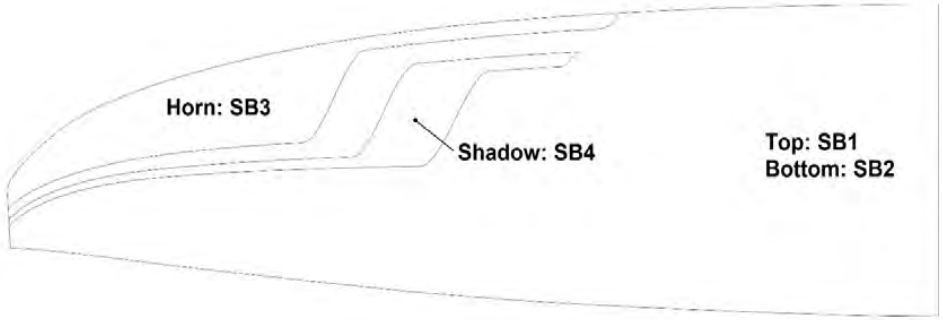
VERVE	SB1	ORANGE	TOP	REF: 477
	SB2	WHITE	BOTTOM	REF: 001
	SB3	BLACK	HORN	REF: 102
	SB4	WHITE	PRINCIPAL SHADOW	REF: 001



BOREAL	SB1	ROYAL BLUE	TOP	REF: 317
	SB2	WHITE	BOTTOM	REF: 001
	SB3	LIMA	HORN	REF: 500
	SB4	WHITE	PRINCIPAL SHADOW	REF: 001



COMET	SB1	PURPLE	TOP	REF: 240
	SB2	WHITE	BOTTOM	REF: 001
	SB3	WHITE	HORN	REF: 001
	SB4	GOLD	PRINCIPAL SHADOW	REF: 939





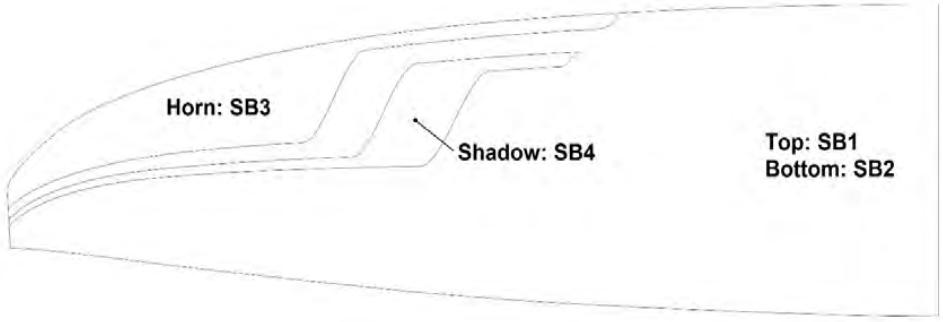
WASP	SB1	GOLD	TOP	REF: 939
	SB2	WHITE	BOTTOM	REF: 001
	SB3	SPECTRA GREEN	HORN	REF: 17-5335
	SB4	BLACK	PRINCIPAL SHADOW	REF: 001



PASSION	SB1	DRAGON RED	TOP	REF: 636
	SB2	WHITE	BOTTOM	REF: 001
	SB3	WHITE	HORN	REF: 001
	SB4	BLACK	PRINCIPAL SHADOW	REF: 102

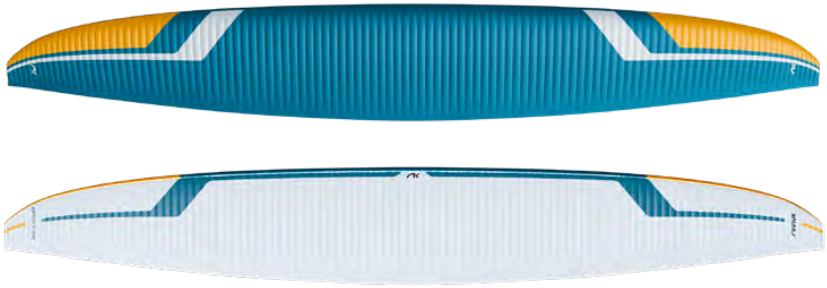


BOUKET	SB1	SLATE BLUE	TOP	REF: 317
	SB2	WHITE	BOTTOM	REF: 001
	SB3	WHITE	HORN	REF: 001
	SB4	PINK	PRINCIPAL SHADOW	REF: 19-2047

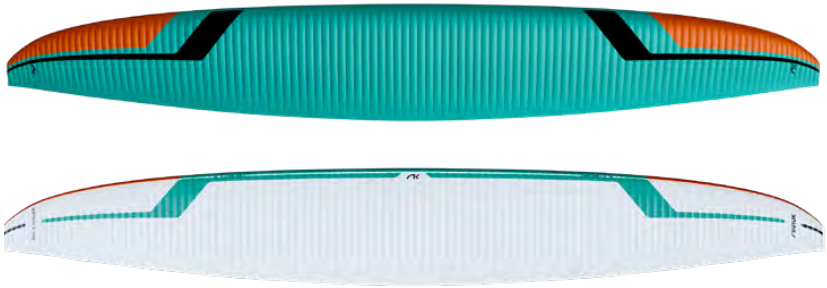




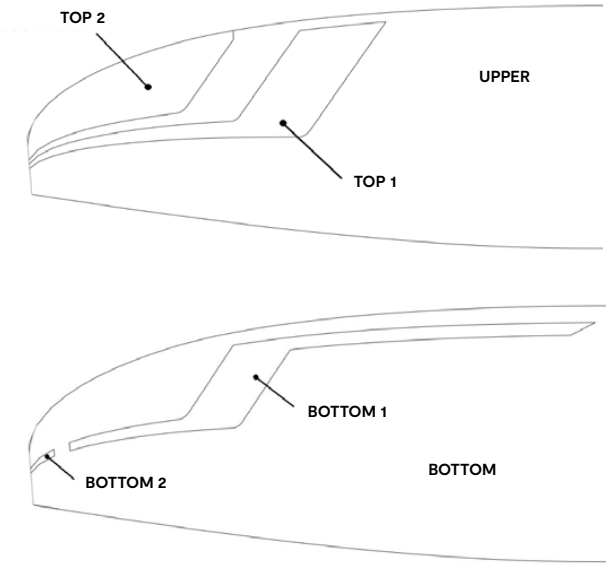
	UPPER	PINK	**LOWER**	WHITE
KAIRA	**TOP 1**	BLACK	**BOTTOM 1**	PINK
	TOP 2	LIME	**BOTTOM 2**	BLACK



	UPPER	SLATE BLUE	**LOWER**	WHITE
TEKNO	**TOP 1**	WHITE	**BOTTOM 1**	SLATE BLUE
	TOP 2	GOLD	**BOTTOM 2**	GOLD



	UPPER	SPECTRA GREEN	**LOWER**	WHITE
PYROX	**TOP 1**	BLACK	**BOTTOM 1**	SPECTRA GREEN
	TOP 2	DARK BRICK	**BOTTOM 2**	BLACK



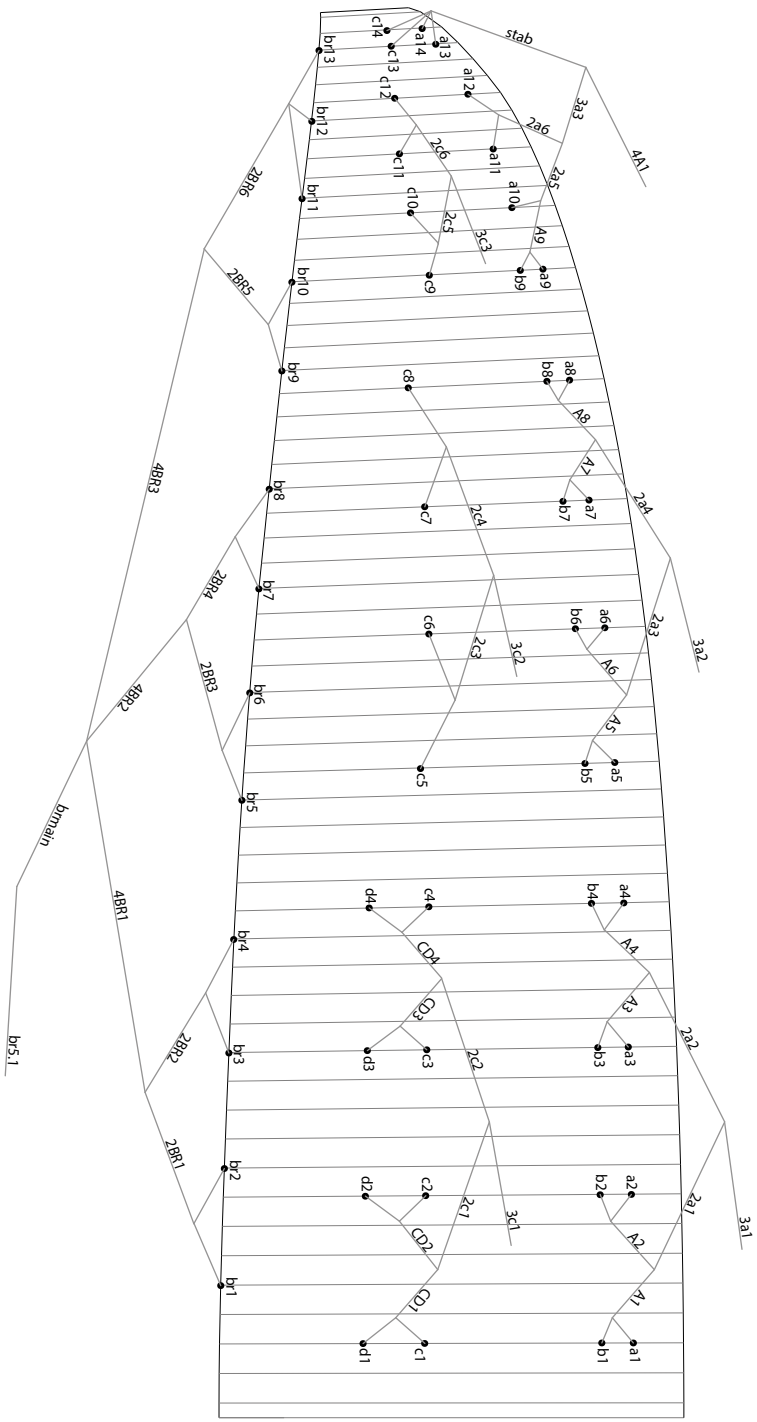
10.3 Materials

CANOPY	FABRIC CODE	SUPPLIER
UPPER SURFACE	HYPERAIRTEX-41 / HYPERAIRTEX-36	DOMINICO TEX (KOREA)
BOTTOM SURFACE	70000 E3H	PORCHER IND (FRANCE)
PROFILES	30DFM / 2044 FM	DOMINICO TEX (KOREA)
DIAGONALS	30DFM / 2044 FM	DOMINICO TEX (KOREA)
LOOPS	LKI - 10	KOLON IND. (KOREA)
REIFORCEMENT LOOPS	W-420 / RIPSTOP	D-P (GERMANY)
TRAILING EDGE REIFORCEMENT	MYLAR	D-P (GERMANY)
RIBS REIFORCEMNET	LTN-0.8/1 STICK	SPORTWARE CO.CHINA
THREAD	SERAFIL 60	AMAN (GERMANY)

SUSPENSION LINES	FABRIC CODE	SUPPLIER
UPPER CASCADES	DC - 35	LIROS GMHB (GERMANY)
UPPER CASCADES	DC - 40	LIROS GMHB (GERMANY)
UPPER CASCADES	A-8001/U 50	EDELRID (GERMANY)
UPPER CASCADES	A-8001/U 70	EDELRID (GERMANY)
MIDDLE CASCADES	DC - 35	LIROS GMHB (GERMANY)
MIDDLE CASCADES	A-8001/U 50	EDELRID (GERMANY)
MIDDLE CASCADES	A-8001/U 70	EDELRID (GERMANY)
MIDDLE CASCADES	A-8001/U 90	EDELRID (GERMANY)
MIDDLE CASCADES	A-8001/U 130	EDELRID (GERMANY)
MIDDLE CASCADES	A-8001/U 190	EDELRID (GERMANY)
MIDDLE CASCADES	A-8001/U 230	EDELRID (GERMANY)
MAIN	A-8001/U 70	EDELRID (GERMANY)
MAIN	A-8001/U 130	EDELRID (GERMANY)
MAIN	A-8001/U 190	EDELRID (GERMANY)
MAIN	A-8001/U 230	EDELRID (GERMANY)
MAIN	A-8001/U 340	EDELRID (GERMANY)
MAIN	A-8001/U 470	EDELRID (GERMANY)
MAIN BREAK	TARAX - 200	EDELRID (GERMANY)
THREAD	SERAFIL 60	AMAN (GERMANY)

RISERS	FABRIC CODE	SUPPLIER
MATERIAL	3455	COUSIN (FRANCE)
COLOR INDICATOR	210D	TECNI SANGLES (FRANCE)
THREAD	V138	COATS (ENGLAND)
MAILLONS	3.5	ANSUNG PRECISION (KOREA)
PULLEYS	RF25109	RONSTAN (AUSTRALIA)

10.4 Line plan



LINE REPLACEMENT

The use of new high performance materials in modern wings is now common. The advantages of using these materials in terms of performance are widely acknowledged as part of our sport's evolution. However, along with those technological advances come additional responsibilities which cannot be avoided. As a result, line inspection and replacement must be carried out more frequently. That increased frequency appears to be encouraging some pilots to try to perform line replacement themselves.

WE STRONGLY RECOMMEND ANY LINE REPLACEMENT IS PERFORMED BY AN AUTHORISED SPECIALIST ONLY.

Ultimately, if the pilot decides to perform any line replacement without professional oversight they therefore assume all responsibility. In this case, these guidelines will have to be followed.

BEFORE REMOVING ANY LINES, CHECK:

- That the line plan is correct according to the glider model and size.
- That the line kit is complete and correct.
- Never assume but always check each individual line for the correct specification.

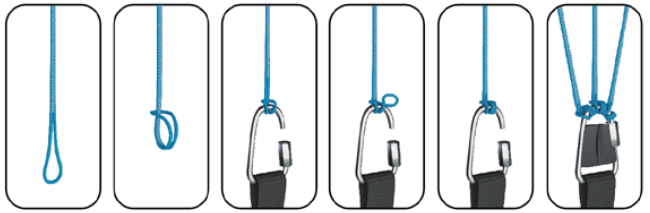
AFTER CONFIRMING THAT ALL LINES ARE CORRECT:

- Fit the new line(s) WITHOUT removing the label.
- Once replaced, measure each line length to confirm the correct measurement.
- Inflate the wing to check for any irregularities.
- The line labels may then be removed but NOT BEFORE completion of the line replacement.

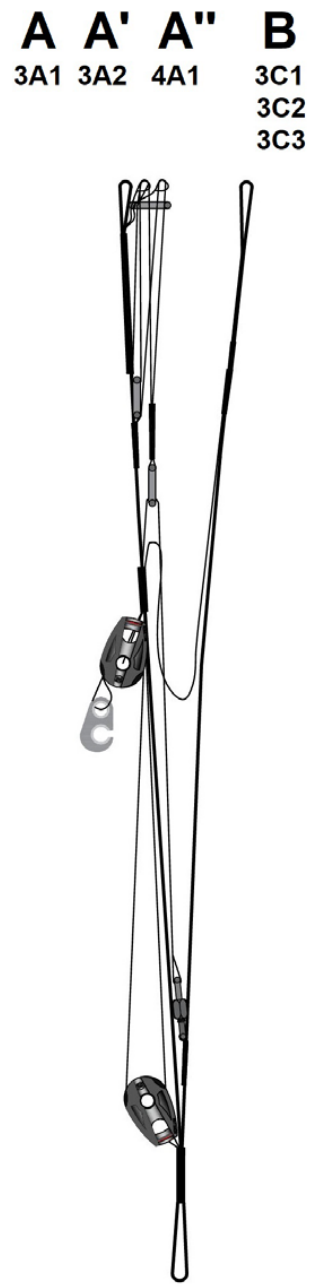
Niviuk strongly recommends for any line replacement to be carried out by an authorised professional only, and will not accept responsibility for any damage or injury caused as a result of incorrect re-assembly.

SPECIAL CONFIGURATION ON LINES 3C1 – 3C2 – 3C3

The 3C1 - 3C2 - 3C3 lines are connected to the maillon by means of a lark's foot/clove hitch. See diagram below. The lark's foot/clove hitch is used to adjust the trim to the preset range. The loop will allow readjustment of the trim due to use, stretching or shrinking. Failure to make this loop compromises the trim of the wing and the safety of the pilot.



10.5 Riser plan



10.6 Line measurements by size

ICEPEAK X-ONE 20

REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm
			A					B					C					D					BRAKE		
a1	8001/U	70	ORANGE	315	b1	8001/U	50	ORANGE	301	c1	8001/U	50	BLUE	440	d1	DC	35	WHT	539	br1	DC	35	WHT	815
a2	8001/U	70	ORANGE	311	b2	8001/U	50	ORANGE	295	c2	8001/U	50	BLUE	432	d2	DC	35	WHT	532	br2	DC	35	WHT	534
a3	8001/U	70	ORANGE	304	b3	8001/U	50	ORANGE	289	c3	8001/U	50	BLUE	423	d3	DC	35	WHT	520	br3	DC	35	WHT	668
a4	8001/U	70	ORANGE	295	b4	8001/U	50	ORANGE	280	c4	8001/U	50	BLUE	415	d4	DC	35	WHT	506	br4	DC	35	WHT	669
a5	8001/U	70	ORANGE	294	b5	8001/U	50	ORANGE	276	c5	8001/U	50	BLUE	1115						br5	DC	35	WHT	683
a6	8001/U	70	ORANGE	288	b6	8001/U	50	ORANGE	270	c6	8001/U	50	BLUE	928						br6	DC	35	WHT	523
a7	8001/U	70	ORANGE	289	b7	8001/U	50	ORANGE	272	c7	8001/U	50	BLUE	922						br7	DC	35	WHT	537
a8	8001/U	70	ORANGE	285	b8	8001/U	50	ORANGE	272	c8	8001/U	50	BLUE	954						br8	DC	35	WHT	621
a9	DC	40	WHT	208	b9	DC	40	WHT	194	c9	DC	40	WHT	558						br9	DC	40	WHT	551
a10	DC	40	WHT	613						c10	DC	35	WHT	458						br10	DC	40	WHT	484
a11	DC	35	WHT	614						c11	DC	35	WHT	457						br11	DC	40	WHT	579
a12	DC	35	WHT	625						c12	DC	35	WHT	479						br12	DC	40	WHT	664
a13	DC	35	WHT	412						c13	DC	35	WHT	420						br13	DC	40	WHT	863
a14	DC	35	WHT	403						c14	DC	35	WHT	427										
A1	8001/U	90	ORANGE	1168						CD1	8001/U	50	Blue	795						2BR1	DC	35	Wht	872
A2	8001/U	90	ORANGE	1045						CD2	8001/U	50	BLUE	643						2BR2	DC	35	WHT	542
A3	8001/U	90	ORANGE	1056						CD3	8001/U	50	BLUE	655						2BR3	DC	35	WHT	814
A4	8001/U	90	ORANGE	1108						CD4	8001/U	50	BLUE	747						2BR4	DC	35	WHT	739
A5	8001/U	90	ORANGE	1044																2BR5	DC	40	WHT	706
A6	8001/U	90	ORANGE	881																2BR6	DC	40	WHT	617
A7	8001/U	90	ORANGE	873																				
A8	8001/U	90	ORANGE	860																				
A9	8001/U	50	ORANGE	490																				
2a1	8001/U	190	ORANGE	1376						2c1	8001/U	90	BLUE	1106						4BR1	8001/U	50	ORANGE	2869
2a2	8001/U	190	ORANGE	1340						2c2	8001/U	90	BLUE	1073						4BR2	8001/U	50	ORANGE	2389
2a3	8001/U	190	ORANGE	1212						2c3	8001/U	90	BLUE	978						4BR3	8001/U	50	ORANGE	2377
2a4	8001/U	190	ORANGE	1117						2c4	8001/U	90	BLUE	899						brmain	8001/U	90	ORANGE	2311
2a5	8001/U	70	ORANGE	660						2c5	8001/U	50	BLUE	498										
2a6	8001/U	70	ORANGE	604						2c6	8001/U	50	BLUE	450										
Stab	8001/U	50	ORANGE	2682																				
3a3	8001/U	90	ORANGE	1972																				
3a1	8001/U	340	ORANGE	4468						3c1	8001/U	190	BLUE	4993						br5.1	TARAX	200	RED	1520
3a2	8001/U	340	ORANGE	4555						3c2	8001/U	190	BLUE	5017								KNOT POINT:		1320
4A1	8001/U	130	ORANGE	3261						3c3	8001/U	70	BLUE	5559										

ICEPEAK X-ONE 22

REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm
			A					B					C					D					BRAKE	
a1	8001/U	70	ORANGE	327	b1	8001/U	50	ORANGE	314	c1	8001/U	50	BLUE	459	d1	DC	35	WHT	560	br1	DC	35	WHT	849
a2	8001/U	70	ORANGE	324	b2	8001/U	50	ORANGE	308	c2	8001/U	50	BLUE	450	d2	DC	35	WHT	553	br2	DC	35	WHT	557
a3	8001/U	70	ORANGE	317	b3	8001/U	50	ORANGE	302	c3	8001/U	50	BLUE	440	d3	DC	35	WHT	541	br3	DC	35	WHT	695
a4	8001/U	70	ORANGE	307	b4	8001/U	50	ORANGE	292	c4	8001/U	50	BLUE	432	d4	DC	35	WHT	526	br4	DC	35	WHT	697
a5	8001/U	70	ORANGE	306	b5	8001/U	50	ORANGE	288	c5	8001/U	50	BLUE	1161						br5	DC	35	WHT	711
a6	8001/U	70	ORANGE	300	b6	8001/U	50	ORANGE	282	c6	8001/U	50	BLUE	966						br6	DC	35	WHT	545
a7	8001/U	70	ORANGE	301	b7	8001/U	50	ORANGE	284	c7	8001/U	50	BLUE	960						br7	DC	35	WHT	559
a8	8001/U	70	ORANGE	297	b8	8001/U	50	ORANGE	284	c8	8001/U	50	BLUE	994						br8	DC	35	WHT	647
a9	DC	40	WHT	217	b9	DC	40	WHT	202	c9	DC	40	WHT	581						br9	DC	40	WHT	573
a10	DC	40	WHT	639						c10	DC	35	WHT	477						br10	DC	40	WHT	504
a11	DC	35	WHT	639						c11	DC	35	WHT	476						br11	DC	40	WHT	602
a12	DC	35	WHT	651						c12	DC	35	WHT	498						br12	DC	40	WHT	691
a13	DC	35	WHT	429						c13	DC	35	WHT	438						br13	DC	40	WHT	899
a14	DC	35	WHT	420						c14	DC	35	WHT	444										
A1	8001/U	90	ORANGE	1215						CD1	8001/U	50	Blue	827						2BR1	DC	35	Wht	908
A2	8001/U	90	ORANGE	1088						CD2	8001/U	50	BLUE	669						2BR2	DC	35	WHT	566
A3	8001/U	90	ORANGE	1099						CD3	8001/U	50	BLUE	682						2BR3	DC	35	WHT	848
A4	8001/U	90	ORANGE	1156						CD4	8001/U	50	BLUE	779						2BR4	DC	35	WHT	771
A5	8001/U	90	ORANGE	1086																2BR5	DC	40	WHT	735
A6	8001/U	90	ORANGE	917																2BR6	DC	40	WHT	643
A7	8001/U	90	ORANGE	909																				
A8	8001/U	90	ORANGE	896																				
A9	8001/U	50	ORANGE	510																				
2a1	8001/U	190	ORANGE	1432						2c1	8001/U	90	BLUE	1152						4BR1	8001/U	50	ORANGE	2986
2a2	8001/U	190	ORANGE	1396						2c2	8001/U	90	BLUE	1118						4BR2	8001/U	50	ORANGE	2489
2a3	8001/U	190	ORANGE	1262						2c3	8001/U	90	BLUE	1019						4BR3	8001/U	50	ORANGE	2480
2a4	8001/U	190	ORANGE	1164						2c4	8001/U	90	BLUE	936						brmain	8001/U	90	ORANGE	2481
2a5	8001/U	70	ORANGE	687						2c5	8001/U	50	BLUE	519										
2a6	8001/U	70	ORANGE	630						2c6	8001/U	50	BLUE	469										
STAB	8001/U	50	ORANGE	2807																				
3a3	8001/U	90	ORANGE	2067																				
3a1	8001/U	340	ORANGE	4677						3c1	8001/U	190	BLUE	5222						br5.1	TARAX	200	RED	1520
3a2	8001/U	340	ORANGE	4771						3c2	8001/U	190	BLUE	5251								KNOT POINT:		1320
4A1	8001/U	130	ORANGE	3411						3c3	8001/U	70	BLUE	5817										

ICEPEAK X-ONE 24

REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm
			A					B					C					D					BRAKE	
a1	8001/U	70	ORANGE	337	b1	8001/U	50	ORANGE	319	c1	8001/U	50	BLUE	472	d1	DC	35	WHT	576	br1	DC	35	WHT	874
a2	8001/U	70	ORANGE	333	b2	8001/U	50	ORANGE	313	c2	8001/U	50	BLUE	463	d2	DC	35	WHT	568	br2	DC	35	WHT	574
a3	8001/U	70	ORANGE	326	b3	8001/U	50	ORANGE	307	c3	8001/U	50	BLUE	453	d3	DC	35	WHT	556	br3	DC	35	WHT	716
a4	8001/U	70	ORANGE	316	b4	8001/U	50	ORANGE	297	c4	8001/U	50	BLUE	445	d4	DC	35	WHT	541	br4	DC	35	WHT	718
a5	8001/U	70	ORANGE	315	b5	8001/U	50	ORANGE	293	c5	8001/U	50	BLUE	1194						br5	DC	35	WHT	732
a6	8001/U	70	ORANGE	309	b6	8001/U	50	ORANGE	287	c6	8001/U	50	BLUE	995						br6	DC	35	WHT	561
a7	8001/U	70	ORANGE	310	b7	8001/U	50	ORANGE	288	c7	8001/U	50	BLUE	989						br7	DC	35	WHT	575
a8	8001/U	70	ORANGE	305	b8	8001/U	50	ORANGE	289	c8	8001/U	50	BLUE	1024						br8	DC	35	WHT	666
a9	DC	40	WHT	223	b9	DC	40	WHT	208	c9	DC	40	WHT	599						br9	DC	40	WHT	590
a10	DC	40	WHT	658						c10	DC	35	WHT	491						br10	DC	40	WHT	519
a11	DC	35	WHT	658						c11	DC	35	WHT	490						br11	DC	40	WHT	620
a12	DC	35	WHT	671						c12	DC	35	WHT	513						br12	DC	40	WHT	711
a13	DC	35	WHT	442						c13	DC	35	WHT	451						br13	DC	40	WHT	926
a14	DC	35	WHT	432						c14	DC	35	WHT	457										
A1	8001/U	90	ORANGE	1250						CD1	8001/U	50	BLUE	851						2BR1	DC	35	Wht	934
A2	8001/U	90	ORANGE	1119						CD2	8001/U	50	BLUE	689						2BR2	DC	35	WHT	583
A3	8001/U	90	ORANGE	1131						CD3	8001/U	50	BLUE	702						2BR3	DC	35	WHT	872
A4	8001/U	90	ORANGE	1190						CD4	8001/U	50	BLUE	803						2BR4	DC	35	WHT	795
A5	8001/U	90	ORANGE	1117																2BR5	DC	40	WHT	756
A6	8001/U	90	ORANGE	944																2BR6	DC	40	WHT	663
A7	8001/U	90	ORANGE	936																				
A8	8001/U	90	ORANGE	923																				
A9	8001/U	50	ORANGE	525																				
2a1	8001/U	190	ORANGE	1473						2c1	8001/U	90	BLUE	1185						4BR1	8001/U	50	ORANGE	3072
2a2	8001/U	190	ORANGE	1437						2c2	8001/U	90	BLUE	1152						4BR2	8001/U	50	ORANGE	2563
2a3	8001/U	190	ORANGE	1299						2c3	8001/U	90	BLUE	1049						4BR3	8001/U	50	ORANGE	2555
2a4	8001/U	190	ORANGE	1199						2c4	8001/U	90	BLUE	964						brmain	8001/U	90	ORANGE	2606
2a5	8001/U	70	ORANGE	707						2c5	8001/U	50	BLUE	534										
2a6	8001/U	70	ORANGE	648						2c6	8001/U	50	BLUE	483										
STAB	8001/U	50	ORANGE	2899																				
3a3	8001/U	90	ORANGE	2137																				
3a1	8001/U	340	ORANGE	4831						3c1	8001/U	190	BLUE	5391						br5.1	TARAX	200	RED	1520
3a2	8001/U	340	ORANGE	4930						3c2	8001/U	190	BLUE	5423								KNOT POINT:		1320
4A1	8001/U	130	ORANGE	3521						3c3	8001/U	70	BLUE	6007										

ICEPEAK X-ONE 25

REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm
			A					B					C					D					BRAKE		
a1	8001/U	70	ORANGE	348	b1	8001/U	50	ORANGE	326	c1	8001/U	50	BLUE	488	d1	DC	35	WHT	595	br1	DC	35	WHT	904
a2	8001/U	70	ORANGE	345	b2	8001/U	50	ORANGE	320	c2	8001/U	50	BLUE	479	d2	DC	35	WHT	587	br2	DC	35	WHT	594
a3	8001/U	70	ORANGE	337	b3	8001/U	50	ORANGE	313	c3	8001/U	50	BLUE	469	d3	DC	35	WHT	574	br3	DC	35	WHT	740
a4	8001/U	70	ORANGE	326	b4	8001/U	50	ORANGE	303	c4	8001/U	50	BLUE	460	d4	DC	35	WHT	559	br4	DC	35	WHT	743
a5	8001/U	70	ORANGE	326	b5	8001/U	50	ORANGE	299	c5	8001/U	50	BLUE	1235						br5	DC	35	WHT	757
a6	8001/U	70	ORANGE	319	b6	8001/U	50	ORANGE	292	c6	8001/U	50	BLUE	1029						br6	DC	35	WHT	581
a7	8001/U	70	ORANGE	320	b7	8001/U	50	ORANGE	294	c7	8001/U	50	BLUE	1022						br7	DC	35	WHT	594
a8	8001/U	70	ORANGE	316	b8	8001/U	50	ORANGE	294	c8	8001/U	50	BLUE	1060						br8	DC	35	WHT	689
a9	DC	40	WHT	231	b9	DC	40	WHT	215	c9	DC	40	WHT	619						br9	DC	40	WHT	610
a10	DC	40	WHT	680						c10	DC	35	WHT	507						br10	DC	40	WHT	537
a11	DC	35	WHT	681						c11	DC	35	WHT	507						br11	DC	40	WHT	640
a12	DC	35	WHT	694						c12	DC	35	WHT	531						br12	DC	40	WHT	735
a13	DC	35	WHT	457						c13	DC	35	WHT	466						br13	DC	40	WHT	957
a14	DC	35	WHT	447						c14	DC	35	WHT	473										
A1	8001/U	90	ORANGE	1291						CD1	8001/U	50	Blue	879						2BR1	DC	35	Wht	966
A2	8001/U	90	ORANGE	1157						CD2	8001/U	50	BLUE	713						2BR2	DC	35	WHT	604
A3	8001/U	90	ORANGE	1169						CD3	8001/U	50	BLUE	726						2BR3	DC	35	WHT	901
A4	8001/U	90	ORANGE	1232						CD4	8001/U	50	BLUE	832						2BR4	DC	35	WHT	823
A5	8001/U	90	ORANGE	1155																2BR5	DC	40	WHT	781
A6	8001/U	90	ORANGE	976																2BR6	DC	40	WHT	686
A7	8001/U	90	ORANGE	968																				
A8	8001/U	90	ORANGE	955																				
A9	8001/U	50	ORANGE	543																				
2a1	8001/U	190	ORANGE	1523						2c1	8001/U	90	BLUE	1225						4BR1	8001/U	50	ORANGE	3175
2a2	8001/U	190	ORANGE	1487						2c2	8001/U	90	BLUE	1192						4BR2	8001/U	50	ORANGE	2651
2a3	8001/U	190	ORANGE	1343						2c3	8001/U	90	BLUE	1085						4BR3	8001/U	50	ORANGE	2646
2a4	8001/U	190	ORANGE	1240						2c4	8001/U	90	BLUE	998						brmain	8001/U	90	ORANGE	2756
2a5	8001/U	70	ORANGE	731						2c5	8001/U	50	BLUE	552										
2a6	8001/U	70	ORANGE	671						2c6	8001/U	50	BLUE	499										
STAB	8001/U	50	ORANGE	3009																				
3a3	8001/U	90	ORANGE	2222																				
3a1	8001/U	340	ORANGE	5015						3c1	8001/U	190	BLUE	5593						br5.1	TARAX	200	RED	1520
3a2	8001/U	340	ORANGE	5121						3c2	8001/U	190	BLUE	5629								KNOT POINT:		1320
4A1	8001/U	130	ORANGE	3652						3c3	8001/U	70	BLUE	6233										

ICEPEAK X-ONE 26

REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm	REF.	MAT.	kg	COLOR	mm
			A					B					C					D				BRAKE		
a1	8001/U	70	ORANGE	365	b1	8001/U	70	ORANGE	342	c1	8001/U	70	BLUE	506	d1	DC	35	WHT	615	br1	DC	35	WHT	937
a2	8001/U	70	ORANGE	361	b2	8001/U	70	ORANGE	336	c2	8001/U	70	BLUE	496	d2	DC	35	WHT	607	br2	DC	35	WHT	616
a3	8001/U	70	ORANGE	353	b3	8001/U	70	ORANGE	329	c3	8001/U	70	BLUE	486	d3	DC	35	WHT	594	br3	DC	35	WHT	766
a4	8001/U	70	ORANGE	341	b4	8001/U	70	ORANGE	320	c4	8001/U	70	BLUE	477	d4	DC	35	WHT	578	br4	DC	35	WHT	770
a5	8001/U	70	ORANGE	340	b5	8001/U	50	ORANGE	313	c5	8001/U	70	BLUE	1279						br5	DC	35	WHT	784
a6	8001/U	70	ORANGE	333	b6	8001/U	50	ORANGE	306	c6	8001/U	70	BLUE	1066						br6	DC	35	WHT	603
a7	8001/U	70	ORANGE	333	b7	8001/U	50	ORANGE	307	c7	8001/U	70	BLUE	1059						br7	DC	35	WHT	615
a8	8001/U	70	ORANGE	329	b8	8001/U	50	ORANGE	309	c8	8001/U	70	BLUE	1098						br8	DC	35	WHT	714
a9	8001/U	50	ORANGE	239	b9	8001/U	50	ORANGE	223	c9	DC	40	WHT	641						br9	DC	40	WHT	632
a10	DC	40	WHT	705						c10	DC	40	WHT	526						br10	DC	40	WHT	557
a11	DC	35	WHT	705						c11	DC	40	WHT	525						br11	DC	40	WHT	663
a12	DC	35	WHT	719						c12	DC	40	WHT	550						br12	DC	40	WHT	762
a13	DC	35	WHT	474						c13	DC	35	WHT	483						br13	DC	40	WHT	992
a14	DC	35	WHT	463						c14	DC	35	WHT	490										
A1	8001/U	130	ORANGE	1338						CD1	8001/U	90	Blue	910						2BR1	DC	35	Wht	1.000
A2	8001/U	130	ORANGE	1202						CD2	8001/U	90	BLUE	739						2BR2	DC	35	WHT	627
A3	8001/U	130	ORANGE	1214						CD3	8001/U	90	BLUE	753						2BR3	DC	35	WHT	933
A4	8001/U	130	ORANGE	1280						CD4	8001/U	90	BLUE	863						2BR4	DC	35	WHT	853
A5	8001/U	90	ORANGE	1216																2BR5	DC	40	WHT	809
A6	8001/U	90	ORANGE	1026																2BR6	DC	40	WHT	711
A7	8001/U	90	ORANGE	1020																				
A8	8001/U	90	ORANGE	995																				
A9	8001/U	50	ORANGE	562																				
2a1	8001/U	230	ORANGE	1573						2c1	8001/U	130	BLUE	1269						4BR1	8001/U	50	ORANGE	3287
2a2	8001/U	230	ORANGE	1537						2c2	8001/U	130	BLUE	1235						4BR2	8001/U	50	ORANGE	2747
2a3	8001/U	190	ORANGE	1400						2c3	8001/U	130	BLUE	1124						4BR3	8001/U	50	ORANGE	2744
2a4	8001/U	190	ORANGE	1286						2c4	8001/U	130	BLUE	1034						brmain	8001/U	90	ORANGE	2919
2a5	8001/U	70	ORANGE	758						2c5	8001/U	50	BLUE	572										
2a6	8001/U	70	ORANGE	695						2c6	8001/U	50	BLUE	517										
STAB	8001/U	90	ORANGE	3129																				
3a3	8001/U	130	ORANGE	2313																				
3a1	8001/U	470	ORANGE	5214						3c1	8001/U	230	BLUE	5813						br5.1	TARAX	200	RED	1520
3a2	8001/U	340	ORANGE	5308						3c2	8001/U	230	BLUE	5853								KNOT POINT:		1320
4A1	8001/U	190	ORANGE	3796						3c3	8001/U	70	BLUE	6480										

10.7 Total line length

ICEPEAK X-ONE - 20

LINES HEIGHT mm

	A	B	C	D	br
1	7826	7812	7825	7924	8211
2	7699	7683	7665	7765	7930
3	7667	7652	7635	7732	7734
4	7710	7695	7719	7810	7735
5	7604	7589	7605		7541
6	7435	7417	7418		7381
7	7333	7316	7333		7320
8	7316	7303	7365		7404
9	7089	7075	7113		7289
10	7007		7013		7222
11	6953		6964		7227
12	6964		6986		7312
13	6866		6874		7511
14	6857		6881		

RISERS LENGHT mm

	A	A'	A"	B	
	500	500	500	500	STANDARD
	360	380	395	500	ACCELERATED

ICEPEAK X-ONE - 22

LINES HEIGHT mm

	A	B	C	D	br
1	8150	8137	8151	8252	8568
2	8020	8004	7984	8087	8276
3	7988	7973	7953	8054	8072
4	8035	8020	8042	8136	8074
5	7925	7909	7926		7873
6	7750	7732	7731		7707
7	7645	7628	7642		7644
8	7628	7615	7676		7732
9	7390	7375	7415		7613
10	7305		7311		7544
11	7249		7260		7549
12	7261		7282		7638
13	7158		7167		7846
14	7149		7173		

RISERS LENGHT mm

	A	A'	A"	B	
	500	500	500	500	STANDARD
	360	380	395	500	ACCELERATED

ICEPEAK X-ONE - 24

LINES HEIGHT mm

	A	B	C	D	br
1	8390	8372	8390	8494	8830
2	8255	8235	8219	8324	8530
3	8224	8205	8189	8292	8321
4	8273	8254	8282	8378	8323
5	8161	8139	8161		8117
6	7982	7960	7962		7946
7	7875	7853	7871		7883
8	7857	7841	7906		7974
9	7611	7596	7638		7851
10	7524		7530		7780
11	7466		7478		7787
12	7479		7501		7878
13	7373		7382		8093
14	7363		7388		

RISERS LENGHT mm

	A	A'	A"	B	
	500	500	500	500	STANDARD
	360	380	395	500	ACCELERATED

ICEPEAK X-ONE - 25

LINES HEIGHT mm

	A	B	C	D	br
1	8676	8654	8676	8783	9145
2	8539	8514	8501	8609	8835
3	8507	8483	8471	8576	8619
4	8559	8536	8568	8667	8622
5	8445	8418	8444		8409
6	8259	8232	8238		8233
7	8149	8123	8144		8168
8	8132	8110	8182		8263
9	7877	7861	7902		8137
10	7786		7790		8064
11	7728		7737		8071
12	7741		7761		8166
13	7629		7638		8388
14	7619		7645		

RISERS LENGHT mm

	A	A'	A"	B	
	500	500	500	500	STANDARD
	360	380	395	500	ACCELERATED

ICEPEAK X-ONE - 26

LINES HEIGHT mm

	A	B	C	D	br
1	8989	8966	8989	9098	9487
2	8849	8824	8808	8919	9166
3	8817	8793	8778	8886	8943
4	8871	8850	8879	8980	8947
5	8764	8737	8751		8727
6	8567	8540	8538		8546
7	8447	8421	8441		8478
8	8418	8398	8480		8577
9	8170	8154	8195		8448
10	8077		8080		8373
11	8015		8024		8380
12	8029		8049		8479
13	7910		7918		8709
14	7899		7925		

RISERS LENGHT mm

	A	A'	A"	B	
	500	500	500	500	STANDARD
	360	380	395	500	ACCELERATED

10.8 Minimum strength of suspension lines

LINE REFERENCE	SIZE				
	20	**22**	**24**	**25**	**26**
8001U-50	21	23	25	26	29
8001U-70	26	29	31	33	37
8001U-90	40	44	47	50	56
8001U-130	57	63	67	72	80
8001U-190	84	93	99	106	118
8001U-230	103	114	122	131	145
8001U-340	165	182	195	208	231
8001U-470	208	230	246	263	292
DC-35	22	24	25	27	30
DC-40	30	33	36	38	42

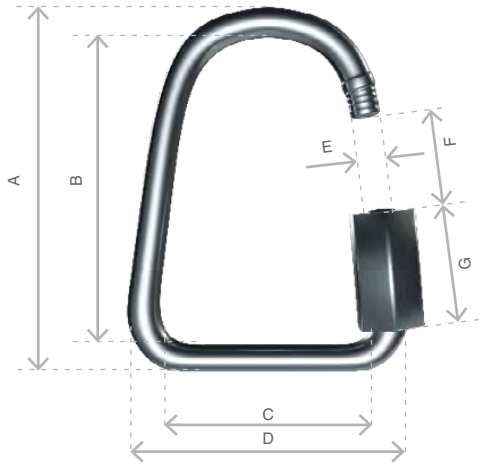
Minimum resistance values in daN

10.9 Maillon & Pulley

DESCRIPTION

MAILLON	DELTA
CODE	3.5
MATERIAL	STAINLESS STEEL
SIZE	3 mm
WEIGHT	5 G/PIECE
QUANTITY	6 PIECES
INSERTS	2 GREEN / 4 BLACK

TECHNICAL SPECIFICATIONS



DIMENSIONS	mm
A	37
B	29
C	14
D	22
E	4
F	5
G	12
LOAD	KG
WORKING LIMIT	110
BREAKING	550

MATERIAL	
AISI 304 STAINLESS STEEL	STANDARD

CLOSING APPLIED BY MANUAL & ENTIRE SCREWING OF THE NUT

TO GUARANTEE THE HIGHEST SAFETY (NO THREAD SHOULD BE OBVIOUS)

SYSTEMATIC CONTROL OF MAILLON QUICK-LINKS BEFORE EVERY FLIGHT

DESCRIPTION

PULLEY	20 mm
CODE	RF25109
MATERIALS	STAINLESS STEEL
	NYLON
	CARBON ACETAL
BEARING	DELRIN®
WEIGHT	9 G/PIECE

TECHNICAL SPECIFICATIONS



DIMENSIONS	mm
A	32
B	20
C	20
Ø	6 max
LOAD	KG
WORKING LIMIT	250
BREAKING	550



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