



GIN

Boomerang 10  
Owner's Manual

Rev.:1.1  
Date: 20/01/2015

**Thank you for taking the time to read the  
Boomerang 10 manual**

© Gin Gliders Inc.

Gin Gliders reserves the right to alter or add to the contents of this Manual at any time. News and the most up to date information will be posted on the Gin Gliders website:

[www.gingliders.com](http://www.gingliders.com)

Express written consent from Gin Gliders is required for any duplication of this manual, in whole or in part (with the exception of short quotations for specialist articles).

Publication of this manual does not imply that the common or trade-names, or other intellectual property contained within it are made available.



## Thank you...

Thank you for choosing the Boomerang 10. We are confident that this paraglider will provide you with countless enjoyable experiences, long flights and exceptional competition results. A thorough knowledge of your equipment will keep you safe and enable you to maximize your full potential.

Please pass on this manual to the new owner if you do resell your glider. Happy Flights and Safe Landings,

The GIN team are very proud of the Boomerang 10, if you have any questions about it that are not answered in this manual, or if you have any hints or tips for getting the most out of the Boomerang 10, please do not hesitate to contact us.

**GIN Team**

# Table of Contents

<b>1. Introduction</b> .....	<b>7</b>
About Gin Gliders.....	7
Manual .....	8
Gin Gliders Homepage.....	8
Gin Gliders and the environment .....	9
Respect for nature and the environment.....	9
Environmentally-friendly recycling .....	9
<b>2. Safety</b> .....	<b>10</b>
Safety advice .....	10
Safety notices.....	10
Liability, warranty exclusion and operating limitations.....	10
Liability and warranty exclusion .....	11
Operating limitations.....	11
Glider categories and guidelines .....	11
CCC certification.....	12
Description of flight characteristics .....	12
Target group and recommended flying experience.....	12
Description of pilot skills required .....	12
Suitability for training.....	12
Before the first flight .....	12
Certified Harnesses.....	12
Reclined harnesses .....	13
Reserve .....	13
Weight Range.....	13
First flight.....	14
<b>3. Flying the Boomerang 10</b> .....	<b>15</b>
Preparation for launch.....	15
5-point check .....	15
Launch .....	16
Light or nil wind launch.....	16
Strong wind launch .....	16
Line knots or tangles .....	16
Level flight and best glide .....	16
Accelerated flight .....	17
B-Riser control .....	17
Turns .....	17



Losing altitude.....	18
Big ears.....	18
B3-Descent.....	18
B-Stall.....	18
Spiral dive.....	18
Landing.....	19
Types of use.....	19
Tow launch.....	19
Motorized flight.....	19
Tandem paragliding.....	20
Aerobatics.....	20
<b>4. Dangerous situations and extreme flying.....</b>	<b>21</b>
Dangerous situations.....	21
Safety training.....	21
Material stress and damage.....	21
Canopy collapses.....	22
Asymmetric collapse.....	22
Cravat / glider wrapped around lines.....	22
Symmetric front collapse.....	23
Types of stall.....	23
Deep stall (parachuting, stable stall).....	24
Full stall (dynamic stall).....	24
Spin.....	24
Other tips for dangerous situations.....	25
Cascade.....	25
Emergency steering.....	25
Flying in the rain.....	25
Advertising and adhesives.....	25
Overloading.....	25
Sand and salt air.....	25
Temperature range.....	26
<b>5. Storing, care, maintenance and repairs.....</b>	<b>27</b>
Storing the paraglider.....	27
Packing the paraglider.....	27
Rucksack.....	28
Storing and transporting the glider.....	28
Care.....	29
Ground handling.....	29
Fabric.....	29
Lines.....	30
Rigid construction.....	30
Cleaning.....	30

Maintenance.....	31
Type designation.....	31
Inspection periods.....	31
Validity of inspection.....	31
Line trimming.....	32
Material stress.....	32
Repairs .....	33
Gin Gliders workshops .....	33
Small repairs to the glider .....	33
<b>6. Dimensions, illustrations, technical and CCC data.....</b>	<b>34</b>
Description .....	34
Cutting-edge Design.....	34
Manufacturing.....	34
Overall illustration.....	35
Technical data.....	35
Riser and speed system.....	36
Risers.....	36
Speed System.....	36
Line system, brakes and line plan.....	37
Line system.....	37
Folding lines .....	37
Brake line adjustment.....	37
Line plan .....	39
Material list .....	40
CCC Test-Lab-Template .....	41
Size S .....	42
Size M.....	47
Size L.....	52
<b>Appendix .....</b>	<b>57</b>
Addresses .....	57
Glider details.....	58
Pilot details / Proof of ownership .....	58
Inspections and repairs overview .....	59
Notes .....	60



## 1. Introduction

### About Gin Gliders

#### **Dream**

In forming Gin Gliders, designer and competition pilot Gin Seok Song had one simple dream: to make the best possible paragliding equipment that pilots all over the world would love to fly— whatever their ambitions.

At Gin Gliders, we bring together consultant aerodynamists, world cup pilots, engineers and paragliding school instructors, all with one goal: creating better paragliders.

#### **Touch**

We're a "hands-on" company that puts continuous innovation and development at the centre of everything we do.

At our purpose-built R&D workshop at head office in Korea, we are able to design, manufacture, test-fly and modify prototypes all in a matter of hours. Our international R&D team is on hand both in Korea and at locations worldwide. This guarantees that your equipment has been thoroughly tested to cope with the toughest flying conditions.

Our own production facilities in East Asia ensure the quality of the finished product and also the well-being of our production staff.

#### **Believe**

We believe that the product should speak for itself. Only by flying can the pilot understand the wing and develop trust and confidence in it. From this feeling comes safety, comfort, performance and fun. The grin when you land should say it all!

## Manual

We recommend that you familiarise yourself with your new paraglider by reading this Manual before your first flight. This will allow you to acquaint yourself its new functions, to learn the best way to fly the paraglider in various situations, and explain how to get the best out of your paraglider. Information in this Manual on design of the paraglider, technical data and illustrations are subject to change. We reserve the right to make changes without prior notification.

The Manual complies with the airworthiness CCC Requirements\_3.5-V8 and forms part of the certification.

There are a total of four important parts to the Manual, which give the following information:

1. Manual (this document):  
Instructions on getting started and using the paraglider
2. Inspection Information:  
General instructions and guidance on carrying out the regular inspection of paragliders
3. CCC Test-Lab-Template:  
CIVL measurement file for CCC gliders (October 2014)
4. Glider details  
Pilot details , proof of ownership and inspections and repairs overview

This Manual was current at the time of going to print. This Manual can be downloaded from GIN's website prior to print.

## Gin Gliders Homepage

Gin Gliders has a comprehensive website, which provides additional information about the Boomerang 10, any updates to the Manual and many other issues related to paragliding. GIN's website is the first port of call for GIN's worldwide following:

**[www.gingliders.com](http://www.gingliders.com)**

On Gin Gliders website, you will find an extensive range of accessories for your paraglider, useful products for pilots, as well as additional information and accessories for your Boomerang 10

You will also find links there to other services and websites:

- Gin Gliders Shops
- Facebook, Twitter & youtube

These websites and their content are provided for your use. The content of Gin Gliders websites has been made available for your use on an "as is" and "as available" basis. Gin Gliders reserves the right to alter the websites at any time or to block access to them.





## **Gin Gliders and the environment**

Protection of the environment, safety and quality are the three basic values of Gin Gliders and these have implications on everything we do. We also believe that our customers share our environmental awareness.

### **Respect for nature and the environment**

You can easily play a part in protection of the environment by practising our sport in such a way that there is no damage to nature and the areas in which we fly. Keep to marked trails, take your rubbish away with you, refrain from making unnecessary noise and respect the sensitive biological equilibrium of nature. Consideration for nature is required even at the launch site! Paragliding is, of course, an outdoor sport – protect and preserve our planet's resources.

### **Environmentally-friendly recycling**

Gin Gliders gives consideration to the entire life cycle of its paragliders, the last stage of which is recycling in an environmentally-friendly manner. The synthetic materials used in a paraglider must be disposed of properly. If you are not able to arrange appropriate disposal, Gin Gliders will be happy to recycle the paraglider for you. Send the glider with a short note to this effect to the address given in the Appendix.

## 2. Safety

**WARNING** The safety advices and instructions contained in this Manual must be followed in all circumstances. Failure to do so shall render invalid the certification and/or result in loss of insurance cover, and could lead to serious injuries or even death.

### Safety advice

Paragliding demand a high level of individual responsibility. Prudence and risk-awareness are basic requirements for the safe practice of the sport, for the very reason that it is so easy to learn and practically anyone can do so. Carelessness and overestimating one's own abilities can quickly lead to critical situations. A reliable assessment of conditions for flying is particularly important. Paragliders are not designed to be flown in turbulent weather. Most serious accidents with paragliders are caused by pilots misjudging the weather for flying.

In Germany, paragliders are subject to the guidelines for air sports equipment and must not under any circumstances be flown without a valid certification. Independent experimentation is strictly prohibited. This Manual does not replace the need to attend training at a paragliding school.

The Manual must be passed on to any new owner if the paraglider is sold. It is part of the certification and belongs with the paraglider.

Observe the other specific safety advice in the various sections of this Manual.

### Safety notices

Safety notices are issued when defects arise during use of a paraglider which could possibly also affect other gliders of the same model. The notices contain instructions on how the affected gliders can be inspected for possible faults and the steps required to rectify them.

Gin Gliders publishes on its website any technical safety notices and airworthiness instructions which are issued in respect of GIN products. The paraglider owner is responsible for carrying out the action required by the safety notice.

Safety notices are issued by the certification agencies and also published on the relevant websites. You should therefore visit on a regular basis the safety pages of the certification agencies and keep up-to-date with new safety notices which cover any products relating to paragliding.

### Liability, warranty exclusion and operating limitations

Use of the paraglider is at the pilot's own risk!

The manufacturer cannot be held liable for any personal injury or material damage which arises in connection with Gin Gliders paragliders. The certification and warranty shall be rendered invalid if there are changes of any kind (incl. paraglider design or changes to the brake lines beyond the permissible tolerance levels) or incorrect repairs to the glider, or if any inspections are missed (annual and 2-yearly check).



Pilots are responsible for their own safety and must ensure that the airworthiness of the glider is checked prior to every flight. The pilot should launch only if the paraglider is airworthy. In addition, when flying outside of Germany, pilots must observe the relevant regulations in each country.

The glider may only be used if the pilot has a licence which is valid for the area or is flying under the supervision of an approved flying instructor. There shall be no liability on the part of third parties, in particular the manufacturer and the dealer.

## Liability and warranty exclusion

In terms of the warranty and guarantee conditions, the paraglider may not be flown if any of the following situations exists:

- the inspection period has expired, or the inspection has been carried out by the pilot him/herself or by an unauthorised inspector
- the pilot has incorrect or inadequate equipment (reserve, protection, helmet etc)
- the glider is used for winch-launching with a winch which has not been inspected or by non-licensed pilots and/or winch operators
- the pilot has insufficient experience or training

## Operating limitations

The paraglider must be operated only within the operating limits. These are exceeded, if one or more of the following points are complied:

- the take-off weight is not within the permissible weight range
- the glider is flown in rain or drizzle, cloud, fog and / or snow
- the canopy is wet
- there are turbulent weather conditions or wind speeds on launch higher than 2/3 of the maximum flyable airspeed of the glider (varies according to the total take-off weight)
- air temperature below -10°C and above 50°C
- the glider is used for aerobatics/extreme flying or flight manoeuvres at an angle greater than 90°
- there have been modifications to the canopy, lines or risers which have not been approved

## Glider categories and guidelines

**WARNING** The descriptions of flight characteristics contained in this Manual are all based on experiences from the test flights, which were carried out under standardised conditions. The classification is merely a description of the reactions to these standard tests.

The complexity of the paraglider system means that it is not possible to give any more than a partial description of the glider's flight behaviour and reactions to disturbances. Even a small alteration in individual parameters can result in flight behaviour which is markedly modified and different from the description given.

## CCC certification

The Boomerang 10 received CCC classification in the final classification by the licensing body.

## Description of flight characteristics

„Paragliders with demanding flying characteristics and potentially violent reactions to turbulence and pilot errors. Recovery to normal flight requires precise pilot input.“

## Target group and recommended flying experience

„Performance pilots with extensive flying experience of at least approx. 75 hours airtime per year, who wish to fly at a top performance level in, e.g. cross-country flying.“

The Boomerang 10 is designed from the outset as a CCC competition glider, and has the highest performance of any GIN glider. It is suitable for the very experienced pilot who flies frequently and wants the highest possible performance, and is aware of the risks associated with high performance gliders and has the skills to handle such wings and extreme flight manoeuvres for this class.

## Description of pilot skills required

„Designed for pilots well-practised in recovery techniques, who fly very actively, have significant experience of flying in turbulent conditions, and who accept the implications of flying such a wing.“

## Suitability for training

The Boomerang 10 is generally not suitable for use as a training glider.

## Before the first flight

**WARNING** Your instructor, dealer or a specialist must test-fly and inspect the paraglider before your first flight. The test-flight must be recorded on the paraglider information label. Any changes or improper repairs to this paraglider shall render invalid the certification and warranty.

## Certified Harnesses

The Boomerang 10 is certified for use with all harnesses with variable cross-bracing (GH type), such as the Gin Genie Race 3. Practically all modern harnesses are GH type harnesses. Older harnesses with fixed cross-bracing (GX type) are not certified and should not be used. Check with the manufacturer of the harness or your paragliding instructor if in doubt whether your harness is a GH or GX type harness.

The adjustment of the harness chest strap controls the distance between karabiners and affects the handling and stability of the glider. Excessive tightening the chest strap increases stability but also the risk of twists following glider collapse, and it also increases the frequency of getting collapses due to poor feedback from the glider. The risk of twisting is also strongly affected by the seating position of pilot. Flying in a laid back (reclined) position makes it much more difficult to react in time to prevent riser twisting. With the chest strap in a more closed position the glider also has more tendency to maintain a stable spiral, lengthening of the chest strap gives more feedback from the glider but decreases stability.



GIN Gliders calculates and draws the plan of the glider with a distance between the carabiners of 44cm. CCC certification test flights are also carried out with this setting. We recommend setting a distance of 42cm to 50cm between the carabiners, depending on the size and design of the harness.

## Reclined harnesses

Reclined harnesses are generally completely enclosed and often have a very low main attachment point. Active flying is very different with them than with an upright harness. To achieve the same level of efficiency and safety in flight with a reclined harness which you are accustomed to with an upright harness, you must systematically learn the appropriate techniques and gain a good deal of experience.

If any problems or disturbances are encountered when flying with a reclined harness, the pilot must immediately assume an upright seating position. Extreme flight manoeuvres flown in a reclined position drastically increase the risk of twist. In addition, pilots often underestimate the reduction in control travel caused by flying an extreme flight manoeuvre.

There is an increased risk of twist when using a reclined harness if a large section of the canopy collapses. If there is an asymmetric collapse and the pilot tips sideways, the resulting twist around the vertical axis with a poorly positioned harness leads to a reduction in control travel. This quickly causes an unintended stall on the open side.

## Reserve

It is a mandatory requirement to carry an approved reserve for use in emergency situations where the paraglider fails and recovery is not possible, for example after colliding with another aerial sports craft. In choosing a reserve, you should be careful that you remain within the specified take-off weight. The reserve is fitted according to the manufacturer's instructions.

## Weight Range

Be sure to fly your glider within the certified weight range given in the Technical Specification section. Due to EPT technology, the Boomerang 10 flies well at any wing loading within this weight range. If you are choosing between 2 sizes, choose your optimum wing loading according to your personal preferences and the conditions you fly in.

If you prefer dynamic flight behaviour with fast reactions, you should fly at a high wing-loading, i.e. choose the smaller model. This may be an advantage in strong, tight thermals.

The dynamics are reduced in the middle and lower part of the weight range. Flight behaviour becomes more straightforward and many pilots fly with this wing loading because they find it easier to centre in thermals, especially weaker and wider thermals. If these features appeal to you, you should fly with a lower wing-loading and choose the larger model.

The Boomerang 10 reacts to weight changes only by slightly increasing or reducing trim speed, with little noticeable effect on glide performance. You can therefore choose the size completely according to your own flying style.

### Overload

The CCC describes the weight measurement with: "All weights are subject to an acceptable tolerance of  $\pm 2\text{kg}$ ". Therefore a slight overload of the wing would be within CCC tolerances. However, flying over the maximum weight further increases the dynamic flight behaviour. High performance wings in particular start to lose their floating ability: in small bubbles, the wing has more horizontal momentum and less tendency towards lifting. A test flight is always recommended if in doubt.

TIP: Check your total flying weight by standing on weighing scales with all your equipment packed into your rucksack. Remember that ballast can also be used to adjust wing loading to the conditions.

### **First flight**

Carry out your first flights only during stable weather, and in a familiar area or on a training slope. You should steer gently and carefully to begin with so that you can become accustomed to the reactions of the glider without stress.



### 3. Flying the Boomerang 10

The Boomerang 10 was developed for performance and competition pilots with extensive flying experience. The basic types of flying described below should be second nature for such pilots, but have been included in this Manual for the sake of completeness.

#### Preparation for launch

A careful pre-flight check is required for any type of aircraft. Make sure that you exercise the same level of care each time carry out the check. Following a consistent method of preparation and pre-flight checks is vital for safe flying. We recommend the following:

- On arrival at the flying site, assess the suitability of the conditions: wind speed and direction, airspace, turbulence and thermal cycles.
- Inspect your glider, harness, reserve handle and pin, helmet and any other equipment.
- Choose a sufficiently large take-off area with even ground and no obstacles.
- Lay the glider out according to the plan form, and get the lines and risers sorted out.
- Put your helmet on. Secure yourself in your harness and don't forget the leg loops!
- Connect the risers to your harness carabiners, ensuring there are no twists or loops around the lines.
- Connect the speed system to the risers with the Brummel hooks.
- Do a final line check by pulling gently on the risers or lines to ensure there are no new knots, tangles or interfering branches or rocks. Take extra care in nil or light winds.

**WARNING** If there are obvious folds in the glider because it has been tightly packed or stored away for a long time, then the pilot should carry out some practice inflations before first launch and smooth out the trailing edge a little. This ensures that the flow profile is correct during launch. It is particularly important in low temperatures that the trailing edge is smoothed out.

#### 5-point check

The 5-point check is carried out immediately before launch to check once again the most important safety points. It should always be carried out in the same sequence so that nothing is overlooked. The 5 points are:

1. Is personal equipment correct (harness, carabiners, reserve, helmet) and are all straps done up?
2. Is the canopy arranged in a half-moon shape and are all the air-entrances open?
3. Are all the lines untangled and are any lines under the canopy?
4. Does the weather, in particular wind direction and strength, allow a safe flight?
5. Are the airspace and launch area clear?

## Launch

The key to a successful launch technique is to practice ground handling on flat ground whenever you can. The Boomerang 10 has good launch characteristics for its class, and no special launch techniques are required.

### Light or nil wind launch

The Boomerang 10 inflates steadily in nil-wind conditions. Simply guide the glider by taking the A1 and A2 main lines just above the A1 riser, keeping your arms bent and hands at the level of the shoulders. Allow your arms to rise in an arc and wait for the glider to inflate and come above your head - do not push the risers. There is no need to pull the risers hard. Run positively as the glider comes above your head. Be sure to look up and check that the glider is fully inflated before you take off, and that there are no tangles in the lines. If any irregularity should occur and you are not yet airborne, abort the launch immediately by stalling the glider. On steep launches, stall one side of the glider and run parallel to the hill. If the glider should come up sideways, and the situation is recoverable, run towards the lower side rather than trying to struggle against the force. An impulse launch where you start running with slack lines close to the glider is not needed.

### Strong wind launch

The Boomerang 10 has good launch characteristics and no special techniques are required. The reverse launch technique is recommended. Holding the brakes, turn around to face the wing passing one set of risers over your head as you turn. We suggest building a "wall" by partially inflating your glider on the ground, thus sorting out the lines thoroughly. Check the airspace is clear and gently pull the glider up with the A1 and A2 riser. When the glider is overhead, check it gently with the brakes, turn and launch. In stronger winds, be prepared to take a couple of steps towards the glider as it inflates and rises.

### Line knots or tangles

If you do take off with a line knot or tangle, try to get clear of the ground and any traffic before taking corrective action. Weight shift and/or counter brake to the opposite side and pump the knotted side with your brake. Be careful not to fly too slowly to avoid a stall or spin. If the knot or tangle is too tight to pump out, immediately fly to the landing zone and land safely.

### Level flight and best glide

When the brakes are open, the Boomerang 10's flight is stable and level. The brake lines can be used to adjust the speed according to the flight situation, to ensure the optimum level of performance and safety. Flying too slowly close to stall speed increases the risk of an unintentional asymmetric or full stall. This speed range should therefore be avoided and used only on landing.

The theoretical best glide speed in calm air is realized at the hands-off position. Minimum sink is reached by pulling approx. 10 cm of brake. If the brakes are pulled more, the sink does not reduce any further, the control pressures increase noticeably and the pilot reaches minimum speed.





## Accelerated flight

Once you have become accustomed to flying the Boomerang 10, you can practice using the speed system, which allows improved glide in headwinds and greater penetration in strong winds. When flying accelerated the glider reacts much faster to a collapse. Also the glider reacts more radically when a collapse happens during accelerated flight compared to flying at trim speed.

Apply the speed system by pushing the speed bar progressively with your feet. Avoid flying accelerated near the ground, and be careful using the accelerator in turbulence.

If you do encounter a collapse while using the accelerator, immediately step off the bar completely before taking any other corrective actions.

## B-Riser control

The Boomerang 10 responds very nicely to B-riser control. With the speedsystem applied the B risers can be pulled backwards towards the pilot to directly control the angle of attack of the glider. Pulling backwards pitches the wing nose-up, increasing the angle of attack, and reduces the chordwise compression in the sail from the lines, making the wing more tuck-resistant. The control movement is subtle and fluid, and only small movements are required. It is important to recognize how much B-riser movement is needed to return the glider to trim speed. The riser-limiters provide a good indicator of when trim speed is approached, making it clear when the maillons are getting close to level (which is a sensible limit to the amount of B-riser control that should be applied). B-riser control can be used to fluidly pilot the wing through turbulence by controlling pitch. The aim should be to control pitch so that the wing stays directly above you. B-riser control can also be used for steering. It is good practice to always glide with gentle tension applied to the B-risers (pulling them backwards about 5cm) so that you can feel the inputs from the wing. Those inputs warn you when turbulence is coming, but also allow you to feel the lifty side of the wing – when the tension on the B-riser on one side increases, pull back on that side to turn slightly towards the lifting air. Following lifting lines using the B-risers this way can make a huge difference to flight performance and gives the Boomerang 10 pilot a very satisfying feeling of being connected to the air movements. A pilot fully in tune with the Boomerang 10 can use these B-riser inputs to follow the lifty lines that lead to the cores of thermals.

## Turns

With the Boomerang 10, Gin Gliders has developed a glider which reacts immediately to steering input and is extremely responsive. The Boomerang 10 performs best in turns when it is flown with sufficient speed and weight-shifting. Too much braking increases the sink rate.

The Boomerang 10 has minimal negative tendency, but nevertheless the glider's high aspect ratio and dynamics on tight turns and centering near slopes take some time to get used to. You should therefore maintain enough distance from slopes and observe safety margins during your first flights until you are familiar with the Boomerang 10's steering.

If more brake is applied, the bank attitude increases and the glider will fly a fast turn increasing in steepness, which will eventually become a spiral dive (further information on this is in the section "Spiral Dive").

## Losing altitude

Extremely strong and widespread lift is found, for example, in storm conditions. The best place to be in this situation is on the ground. Nevertheless, if you have been caught out by the weather and find yourself needing to descend rapidly, there are several ways to do so. The best way is, of course, to find sink. Failing that, try one of the techniques below. Most of these techniques place undue stress on your glider, and should be avoided if you want to extend its lifetime. We recommend you initially practice these manoeuvres under qualified supervision during a safety training course.

### Big ears

It is possible to do big ears on the Boomerang 10, but it takes great arm strength to hold in the ears and the glider loses structure when the ears are in. Therefore the maneuver is not recommended.

### B3-Descent

To increase your sink rate, first apply a little speed bar (about 25%) and then pull in the (outer) B3 lines simultaneously, firmly and progressively. To exit the manoeuvre, release the tips simultaneously and progressively and then release the speedbar.

### B-Stall

This manoeuvre is not possible with the Boomerang 10. For fast descent use a steep spiral or B3-Descent as described above.

### Spiral dive

The spiral dive is an extreme manoeuvre. Practice spiralling with caution and lower sink rates to get a feeling for the Boomerang 10's behaviour. Weight shift and pull the brake on one side gradually. Let it accelerate for two turns and you will enter the spiral dive. Once in the spiral, you can control your descent rate and bank angle with weight shift and the outer brake. Spiral dives induce large G forces, and these can disorient the pilot and stretch the glider lines and sail.

The outer wing tip may collapse during the spiral dive although this is no cause for concern. It can be avoided by lightly braking on the outside. Release the brakes carefully.

**WARNING** A pilot who is dehydrated and/or not accustomed to spiralling can lose consciousness in a steep spiral dive! As with all types of aircraft, we advise you to assist the glider to exit from the spiral dive in a controlled manner.

To allow the glider to exit from a spiral dive, your position in the harness must either be neutral, or even better, on the opposite site of the turn while spiralling. If you release the inner brake the wing will normally exit the spiral dive by itself. The Boomerang 10 has no tendency to stay in a stable spiral, but nevertheless, you should know how to exit from a stable spiral:



weightshift actively to the outside of the turn and pull the outer brake until you feel the deceleration of the wing and your body moving towards a more upright position. Then, release the outer brake and let the glider decelerate for one or two more turns. Apply a short brake action on the inside brake just before the glider exits the spiral dive completely. This will burn off the remaining energy and avoid a big pendulum moment after exiting the spiral.

We advise you to limit the sink rate of the spiral to a maximum of 14 m/s and always maintain ground clearance of 150 – 200m. It is possible to reach a much higher sink rate but the following risks of increases with higher sink rates:

- cause a loss of consciousness
- lose control over the flight manoeuvre and sink rate, the glider will go into a stable spiral. If this happens, immediately deploy your reserve!
- stress loading and/or loss of consciousness can occur during the spiral which make subsequent recovery impossible

## Landing

The Boomerang 10 has good handling and completely normal landing characteristics, so no special techniques are required. Select a familiar landing area free of obstacles and carefully note the wind speed and direction in the landing area. The minimum flying speed and big flaring reserve of the Boomerang 10 will help you to make a soft landing in all conditions. Approach the landing with sufficient airspeed and don't leave your last turn too late or too steep.

Do not pump the brakes to degrade the glide angle, you risk entering a deep stall. Always fly with sufficient speed when you are near the ground (well above stall speed) to avoid an unintentional stall.

Before landing, slide your legs forward in the harness so that you adopt the standing position. Never land in the seated position; it is very dangerous for your back even if you have back protection, which is only a passive safety system. Standing up before landing is an active safety system, and is much more effective.

## Types of use

The Boomerang 10 was developed and tested for use solely as a paraglider for foot launch. Any use other than as intended is prohibited.

### Tow launch

The Boomerang 10 is suitable for towing by suitably qualified pilots. The Boomerang 10 has no tendencies towards deep stall/parachuting. There is sufficient margin to counter steer the glider in a normal towing situation. Make sure you use proper equipment, experienced personnel, the recommended techniques and all relevant safety precautions for towing.

### Motorized flight

The Boomerang 10 has not been developed for motorized flight.

## **Tandem paragliding**

The Boomerang 10 has not been developed for use in tandem paragliding.

## **Aerobatics**

The Boomerang 10 is not designed for aerobatics and in many countries acro flying is forbidden. Besides the inherent risks, extreme manoeuvres of any kind place unnecessary stress on the glider and effectively shorten its lifespan. We strongly recommend no acro flying or unnecessary manoeuvres to avoid a risk of unpredictable flight attitudes, which could lead to damage to material and structural failure.



## 4. Dangerous situations and extreme flying

### Dangerous situations

Pilot error, extreme wind conditions or turbulence which goes unnoticed by the pilot for too long may leave the wing in an unusual flying position, requiring special reaction and skills on the part of the pilot. The best way to learn how to react calmly and correctly in a serious situation is to attend safety training, where you will learn how to manage extreme situations under the guidance of a professional.

Ground-training is another safe and effective method of familiarising yourself with your glider's reactions. Launch can be practised, as can small flying manoeuvres, such as stall, asymmetric collapse, front stall etc.

Any pilot who flies in turbulent conditions or who makes an error in handling the glider is at risk of getting into an extreme situation. All of the extreme flight figures and flight attitudes described here are dangerous if they are carried out with inadequate knowledge, without the right safety altitude or without training.

Always keep within the recommended limits. Avoid aerobatics and extreme loading such as spirals and big ears. This will prevent accidents and avoid over-loading the glider.

In turbulent conditions, always keep enough distance from rock faces and other obstacles. Time and sufficient altitude are needed to recover from extreme situations.

Deploy your reserve if the corrective manoeuvres described in the following sections do not return the glider to a controllable flying position or if there is not enough altitude for correction.

### Safety training

The Boomerang 10 is optimised for competition paragliding and is intended only for professional pilots who are able to demonstrate above-average experience in safety training. The Boomerang 10 is under no circumstances suitable for a pilot's first experience with safety training.

Special folding lines were used for certification of the Boomerang 10 (refer here also to the section "Folding lines"). Without these folding lines, tucks and front stalls may vary from the CCC guidelines.

### Material stress and damage

Gin Gliders advises against subjecting the materials of the Boomerang 10 to excessive stress during a safety training course.

Uncontrolled flight positions can occur during safety training, which are outside the manufacturer's limits for the paraglider and which can put the glider under excessive stress.

Trimming the line lengths and canopy material after safety training can lead to a general deterioration in flight characteristics.

Damage as a result of safety training is not covered by the warranty.

## Canopy collapses

Collapses of the canopy can occur in strong turbulence. The Boomerang 10 will recover with pilot input through weightshift and B-riser control in almost all situations. Only if the wing surges very fast in front of you should you stop it with the brakes. However, it is recommended that you follow the advice below in order to help the wing recover more rapidly.

### Asymmetric collapse

In the event of encountering strong turbulence and suffering an asymmetric collapse on one side, the Boomerang 10 will promptly and easily re-inflate without interference from the pilot, but the wing will turn slightly towards the collapsed side. This might be unwanted close to the ground or other gliders. Maintain your course by weight shifting away from the collapsed side. This action can be aided by applying a little gentle force on the B-riser or brake opposite to the deflation. This will normally be sufficient for recovery. However, it is sometimes necessary to pump out the deflated side with a firm and smooth pumping motion. Let the glider regain its flying speed after it has re-inflated.

It is important not to apply too much brake input, as this increases the risk of deep stall.

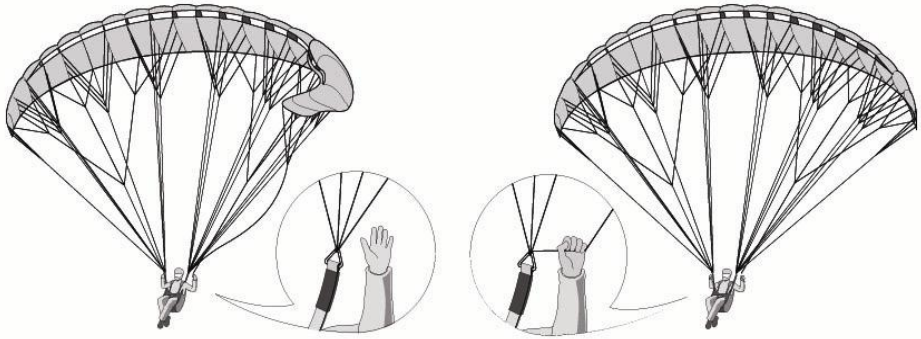
If you have a big collapse - especially when flying accelerated - you must observe the following:

When a big collapse happens, due to the difference in weight and inertia of the canopy and pilot, the pilot will continue to travel forward and the canopy will fall behind the pilot, especially when flying accelerated. You must wait until you pendulum back below the canopy before reacting and carefully counter-braking the open side of the canopy. If you react too early, you risk stalling the collapsed canopy completely and this can lead to a cascade of further collapses.

When you have a big collapse in accelerated flight you must first release the speed bar immediately. Check your position relative to the ground, and if you have enough space stay neutral with your weight and brake to open side slightly to control the turn, but let the glider turn, to maintain airspeed. Watch the open side of the wing, and apply brake to control and limit the turn, but avoid applying so much brake that the open side of the wing starts to arc backwards as this indicates the flying side of the wing is on the edge of stall. Once the turn is stabilized weightshift heavily towards the open side of the wing so that you can limit the turn or maintain direction without having to apply excessive brake. In most cases the collapse will open on its own, but you may need to pump it out. This is the optimum action to avoid a spin or stall and help your glider to recover as fast as possible.

### Cravat / glider wrapped around lines

A cravat occurs after a severe deflation when the wing tip becomes trapped in the glider lines. It can occur on the Boomerang 10, usually after big deflations or in cascading situations. The pilot should be familiar with the procedure for correcting it. On the Boomerang 10, there is a separate stabilizer/winglet main line that goes down to the A2 riser. This line usually becomes slack in the event of a cravat. Pull it down completely until it becomes tight and the cravat normally comes out.



**Fig. 1:** Grabbing the stabilizer/winglet main line

Alternatively, on the side of the wing with the cravat, pull the brake fast and strong. Be careful not to let the wing enter a developed spin. If the tangle has not come free after several attempts, you still have the option to open it like a deep stall or a full stall. These flight manoeuvres always require adequate altitude and a high level of pilot skill.

Deploy your reserve if the corrective manoeuvres described in the following sections do not return the glider to a controllable flying position or if there is not enough altitude for correction.

## Symmetric front collapse

A symmetric front collapse will normally reopen promptly by itself without any pilot input. The glider will regain airspeed with a small surge. If counter braking, be careful not to over-correct or to brake too early, when the glider is still behind you - danger of a stall! If the glider does not re-open by itself, pull the brakes firmly for a second or two and then release promptly. This also prevents the wing tips moving forwards during the front stall. In the case of extreme front stalls across the entire wing chord, the wing tips may move forward. Stop the glider forming a U-shape by timely and energetic use of the brakes. There is a risk that the wingtips will become tangled if they touch each other.

## Types of stall

When a paraglider flies through the air, a laminar and turbulent boundary layer is created. Extremely dangerous flight configurations can result if the laminar boundary layer is interrupted, with practically the entire airflow along the top surface braking away. This happens in particular when the angle of attack is too great.

**WARNING** Full stall and spin are manoeuvres which can be fatal if recovery is not correct. These manoeuvres should therefore be avoided. However, it is important to learn how to recognise the indications that a glider is about to stall so that you can take immediate action to prevent it.

There are three different types of stall in paragliding.

## Deep stall (parachuting, stable stall)

The Boomerang 10 has no tendency to get into a deep stall. Should this nevertheless occur, make sure your brakes are fully released, the glider will then normally recover on its own immediately. If the glider still doesn't recover either put your hands on the A risers and push forward or use the speed bar to accelerate the wing.

You can recognise a deep stall by the glider getting "mushy" and the airflow around your ears decreasing. The glider may also compress spanwise. Flying in strong turbulence or exiting a deflation with too much brake applied can cause this situation. A wet glider also has a higher deep stall tendency, and you should do everything you can to avoid flying in the rain. If you do pass through some rain apply speed bar until you are confident that the wing has dried out. An out-of-trim glider, caused by changes in line lengths due to prolonged use, may also have a higher deep stall tendency.

## Full stall (dynamic stall)

The full stall happens when the wing partially deflates and loses its arched shape. It is triggered when the maximum possible angle of attack is exceeded. The most common cause is going below the minimum speed or flying near the minimum speed combined with the effects of turbulence.

In full stall, the paraglider loses its forwards travel, surges backwards and deflates. If the brakes are held down, the canopy comes up over the pilot again. The result is an almost vertical descent with a sink rate of approx. 8m/s.

Because of the Boomerang 10's high aspect ratio, during a stall the wing-tips tuck and move behind the canopy. They return to their original position when the brakes are released. Slowly release the brakes, making sure that this is done symmetrically. As soon as the glider is completely open above the pilot, the brakes are released.

As this is done, the canopy accelerates forwards dynamically and picks up speed. Do not brake too soon (otherwise it could go into a full stall again), and be careful to avoid a front stall by making sure that it does not shoot too far forwards.

**WARNING** If the canopy has gone back during the full stall, the brakes must be held down, otherwise the canopy may surge forward and, in an extreme case, end up underneath the pilot. Hold the brakes down until the canopy is above you again.

## Spin

The spin is a stable flight attitude, in which one side of the canopy stalls, while the other side continues to fly forward. The glider turns around the stalled side of the wing.

In normal thermal flight, you are not very far from the limits of a spin. If a spin occurs, just let up the brakes and wait for the glider to surge forward, checking it with the brakes if it surges too far. Never release the spin if the glider is far back behind you, always try to release it when the glider is above or in front of you!

If the spin does not stop, check whether you have released the brakes fully!





## Other tips for dangerous situations

### Cascade

Many reserve deployments are a result of a cascade of over-corrections by the pilot. Please note that over-corrections are often worse than no input at all.

### Emergency steering

If a brake is not operational for some reason, you can steer the Boomerang 10 with the B- risers. Add steering input by weight-shifting in your harness. Be careful not to pull the riser too much, to avoid any possibility of a spin.

### Flying in the rain

We strongly advise you not to fly in the rain on any paraglider including the Boomerang 10. If you do fly in the rain, be aware that you will have a greater risk of entering a deep stall. It is wise to apply speedbar after passing through rain until you are confident that the glider is flying normally, and has preferably dried out so that there is no longer any risk of deep stall.

Flying in extremely humid weather or in rain is outside of the operating limits of the glider. If you are not able to avoid flying in rain, please observe the following:

- it is advisable to fly with slight acceleration during and after the rain (min. 30% or more)
- use no brake input or as little as possible
- control travel reduces
- avoid tight turns, especially in the final approach. If conditions allow, you should also fly slightly accelerated in this phase
- avoid large angles of attack and the possible early stall near the ground (release the speed bar only slowly)

### Advertising and adhesives

Always make sure before attaching advertising to the glider that the adhesive planned will not alter the glider's flight behaviour. If you are in doubt, we recommend that you do not attach the adhesive. Attaching adhesives to the glider which are large, heavy, or made of unsuitable material may result in revocation of the certification.

### Overloading

The glider structure is put under high levels of strain in particular on extreme flight manoeuvres, rapid descent methods (spiral dives) or prohibited aerobatic manoeuvres. They considerably accelerate the aging process of the structure and should therefore be avoided.

The glider must be inspected earlier than is usually the case if it has been put under more than the usual degree of strain.

### Sand and salt air

In many cases, sand and salt air cause the lines and fabric to age much more rapidly. If you often fly near the sea, the glider should be inspected more frequently than normally required.



## Temperature range

Temperatures under  $-10\text{ }^{\circ}\text{C}$  and over  $+50^{\circ}\text{C}$  can make the paraglider unfit to fly. The manufacturer's warranty will lapse if the glider is used outside of this temperature range.

## 5. Storing, care, maintenance and repairs

### Storing the paraglider

#### Packing the paraglider

It is very important to pack the glider carefully in order to ensure the longevity of the leading edge reinforcements. Fold up the Boomerang 10 as shown in the diagrams below. The leading edge reinforcements (Mylar and Rigid-System) on the front edge are placed on top of each other to avoid bending or misshaping them. This method of packing ensures that the leading edge is treated carefully, which will increase the glider's life, performance and launch behaviour.

If the reinforcements have been bent or misshapen, they distort more easily during flight, creating an altered air inflow which can lead to a loss in performance and changes in flight behaviour. The leading edge reinforcements also perform an important function on launch. Therefore, the less they have been bent, the more easily the glider will inflate and launch.

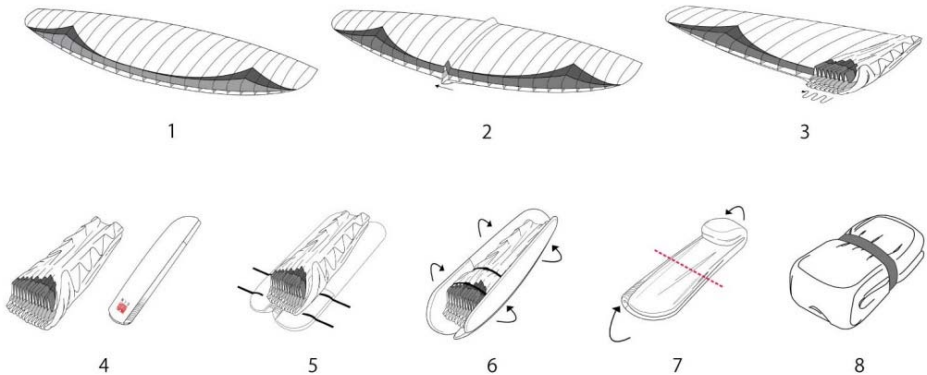


Fig. 2: Packing the Boomerang 10

1. Spread out the paraglider completely on a smooth surface. Do not drag the paraglider across any rough surfaces such as gravel or asphalt. This may damage the seams and surface coating.
- 2.-3. All the ribs on one side are placed one on top of one another, so that the leading edges are not bent.
4. Then continue as in the second step, placing the leading edges of the other side on top of the next until you reach the tip of the glider. Place the concertina bag underneath the glider which has been folded together, so that the ribs are all lying along the length of the concertina bag.
5. The glider is now folded up along its length, and the leading edges are on top of each other without having being bent. Fasten the straps near the leading edges, so that they do not slip, and the straps in the middle and at the end of the glider.

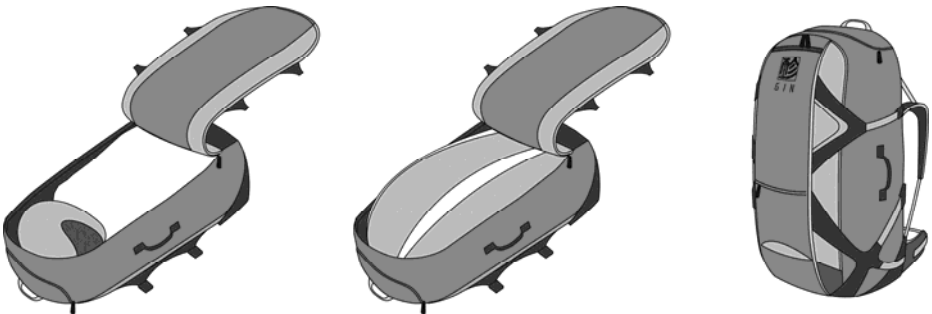
6. Do up the zip, making sure that none of the lines or fabric is caught in the zip.
7. Fold up the glider along its length, with the first fold below the leading edge reinforcements. Pay particular care not to bend any of the rigid reinforcements!
8. Fold the glider again. Then place the compression strap around the glider and fasten it by pulling gently. Make sure that the glider is only loosely folded and is not bent or compressed excessively.

### Rucksack

All GIN gliders are delivered with a durable ripstop Codura® rucksack with 160L capacity. The rucksack should be packed carefully to achieve maximum comfort. First, place the glider inside the harness and then put the top of harness inside the bottom of the rucksack with the glider side next to the back of the rucksack. Finally, tighten the internal and external compression straps and adjust the shoulder and waist straps to ensure the equipment stays firmly in place when walking. There are also two storage pockets for accessories.



An XXL rucksack is available as an optional extra for pilots that require it.



**Fig. 3:** Packing the rucksack

### Storing and transporting the glider

Even if your paraglider was completely dry when it was packed up after the final flight of the season, for long-term storage you should if possible take it out of the back pack and spread out the canopy a little in a clean, dry place away from direct light. If you do not have the space to do this, then open the backpack, internal bag and belt as much as possible and avoid compressing it. It must be stored at a temperature between 10° and 25° C and in relative humidity between 50 and 75%. Make sure too that the paraglider is not stored in a place where animals such as mice or cats could use it as a place to sleep.

Do not store the paraglider near any chemicals. Petrol, for example, causes the material to disintegrate and can cause considerable damage to your paraglider. When your equipment is in the car boot, keep it as far away as possible from any spare petrol cans or oil containers.



The Boomerang 10 should not be exposed to extreme heat (e.g. in the boot of the car during summer). The heat may cause any moisture present to be pressed through the fabric, thereby damaging the coating. High temperatures accelerate the process of hydrolysis, particularly when combined with moisture, which damages fibres and coating. Do not store your paraglider near radiators or other heat sources. Always transport your glider in the special concertina bag and use the backpack provided for the rest of the equipment.

## Care

The materials used in the Boomerang 10 have been carefully selected for maximum durability and performance. Nevertheless, following the guidelines below will keep your paraglider airworthy and will ensure a long period of continuous safe operation. Excessive wear is caused by careless ground handling and packing, unnecessary exposure to UV light, chemicals, heat and moisture.

### Ground handling

The following should be avoided:

- Violent shocks to the upper surface (e.g. when the canopy crashes to the ground leading edge first whilst ground handling).
- Dragging the glider along the ground.
- Stepping on the lines or canopy. The Kevlar line inside the sheath can take lots of pulling force without stretching, but is sensitive to bending with small radius.
- Opening your wing in strong winds without first untangling the lines.

### Fabric

Care is essential to ensure that the fabric and glider remain durable and retain their qualities. The glider should therefore be protected from unnecessary UV light. Do not unpack your glider until immediately before flight and pack it up straight after landing. Modern paraglider fabrics have better protection against the sun, but UV rays in particular are still one of the decisive factors in how the fabric ages. The colours will fade first and then the coating and fibres will begin to age.

When choosing a place to launch, try to find somewhere which is smooth and free of stones and sharp objects. Do not stand on the glider. This weakens the fabric, especially if it is on a hard or stony surface. Pay attention to the behaviour of spectators at the launch site, especially children: do not hesitate to draw their attention to the sensitive nature of the fabric.

When you are packing up your glider, make sure that there are no insects trapped inside. Many insects produce acids when they decompose, which can cause holes in the fabric. Grasshoppers make holes by biting through the fabric and also excrete a dark liquid which stains. Keep animals away when you are packing up. Insects are not attracted by any particular colours, contrary to what is commonly believed.

If the glider gets wet or damp, it should be dried as soon as possible in a well-ventilated room (but out of the sun). It may take several days before the canopy has dried completely because the fibres absorb water. Mould may form if the paraglider is stored wet and the fibres may rot,

particularly when it is warm. This can make the paraglider unsuitable for flying within a short time.

A brand-new glider will often be compressed when delivered. This is solely for the initial delivery and the glider should not be compressed in such a way again. Do not pack your glider too tightly after use and, even though it is very comfortable, never sit on the backpack with the glider inside.

If salt water gets on the glider, it should be rinsed immediately in fresh water (refer to the section "Cleaning").

## Lines

The Boomerang 10 has various different high-quality and accurately manufactured lines which have been selected according to the load and area of use. You should also protect the lines from unnecessary UV light because, as with the fabric, UV light in particular will weaken the lines.

Dyneema lines, which are used in the area of the top brake lines, for example, are very temperature-sensitive and can be permanently damaged at temperatures above 75° C. Therefore your glider should never be stored in a hot car especially during summer.

Be careful that there is no abrasion caused to the coating on the lines by rubbing, particularly when ground-training with crossed risers.

Do not walk on the lines after the glider has been spread out and watch out for spectators or skiers who may inadvertently go over the lines.

When you are packing up the glider, be careful to avoid putting any unnecessary kinks in the lines and use only the overhand knot or bowline knots described for the brake lines.

## Rigid construction

Various forms of plastic rods are used in the Boomerang 10 (rigid construction), which create the leading edge's shape and the canopy's stability. To ensure that the plastic rods keep their shape, it is important that you pack the glider as described in the section "Packing the paraglider".

The plastic rods on the Boomerang 10 can all be replaced through small pockets. If you notice that a plastic rod has been damaged or misshapen because of incorrect use, this can be replaced by Gin Gliders or a Gin Gliders authorised workshop.

## Cleaning

If you do have to clean the glider, use only lukewarm fresh water and a soft sponge. Use a weak soap solution for stubborn stains, and then rinse it out carefully and thoroughly. Leave the glider to dry in a place which is well-ventilated and in the shade.

Do not under any circumstances use chemicals, brushes, rough cloths, high-pressure cleaners or steamers to clean the glider, as these can damage the fabric coating and weaken it. The glider becomes porous and loses braking strength.

Do not under any circumstances put the glider in the washing machine. Even if washing powder is not used, the glider would be badly damaged by the mechanical action of the machine. Do not put the canopy into a swimming pool - chlorine will damage the fabric. If you have no choice but



to rinse the glider, e.g. following a landing in the sea, gently wash it down inside and out with fresh water. Frequent rinsing accelerates the aging process.

## Maintenance

### Type designation

GIN gliders have an exact identification on the underside of the wingtip or on the centre rib, which is obligatory for all paragliders. The information required is set out in the airworthiness requirements.

It is helpful to provide the type designation of the paraglider if you are contacting your Gin Gliders dealer with any queries or ordering replacement parts or accessories, to ensure accurate identification.

### Inspection periods

Failure to observe the inspection periods shall render invalid the certification and warranty. A properly completed logbook with details of all flying and training will help you to comply with these periods.

The Boomerang 10 has to be inspected for a trim check by an authorized GIN agent during the first 12 months.

The Boomerang 10 should be regularly inspected by a qualified professional every 100 hours (including ground handling), or every 12 months, whichever comes sooner. Ground handling time must be at least doubled when calculating the total hours of use because of the increased wear and tear on the glider.

Subsequent inspections should be made annually. Inspection must be made not only of the fabric, but also of the lines and all other parts of the glider. The maintenance instructions, available on our homepage [www.gingliders.com](http://www.gingliders.com), have to be observed.

A full inspection will give you peace of mind and extend your glider's lifetime. Additional inspections should be performed by a qualified person following a crash or violent landing on the leading edge, or if you note a deterioration of performance or behaviour.

You should also check for any damage to your lines, sail, risers and connectors before each flight.

We recommend replacing the line set at least every 150 hours.

### Validity of inspection

It is very important that your glider is serviced at the required intervals throughout its entire life. In order to benefit from Gin Gliders warranty:

- you must have your paraglider inspected by Gin Gliders or an inspection agent authorised by Gin Gliders
- the documentation and the result of the inspection must be clearly identifiable (date and place / name of the inspector) and be entered near the glider information/certification sticker.

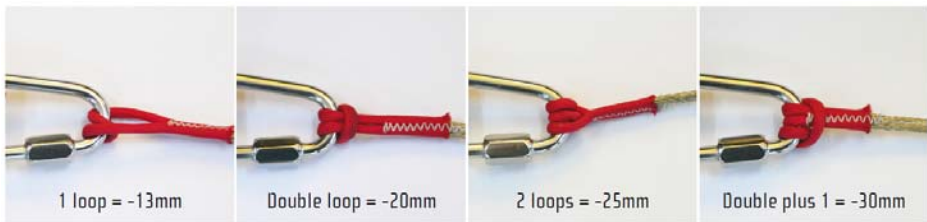
## Line trimming

The Boomerang 10 is trimmed to give the highest possible level of performance and safety. The aramid lines may shrink or stretch in normal use and particularly after hard shock-reinflations.

Pilots should check that the lines remain within tolerance. The Boomerang 10 is certified with the lines trimmed so that the total line length from tab to riser is within 2cm of the values stated in the line-plan. The lines must be measured with a load of 5kg, in order to ensure reproducible results for a comparison with the lengths in the check sheets.

Due to different measuring systems and calibration there is a possibility of a difference in the absolute line lengths. In this case, the measured values should first be corrected to the same base of the Boomerang 10 check sheet data. Correct line length and symmetry are important for performance, handling and have a considerable influence on flight behavior.

If the lines are more than 2cm out of tolerance they should be replaced. If the lines are less than 2cm out of tolerance they can be re-trimmed either by taking (or releasing) loops on the Maillons or by adding an extended Maillon. Contact your dealer or Gin Gliders for details of how to retrim your glider.



**Fig. 4:** Allowed loops on Maillons

**WARNING** Do not under any circumstances use knots to shorten the lines. Any knot will weaken the line considerably and may cause the line to break in case of high load. The overhand knot and bowline knots described are permitted only for connecting the main brake lines/brake handle.

Lines age and lose strength even if the paraglider is used infrequently or not at all. This can affect the safety and function of your paraglider. Signs of wear are slight bumps or changes in flying characteristics. The lines must then be replaced immediately. Use only inspected and approved lines, which can be obtained through Gin Gliders.

A damaged line can result in loss of control of the glider. Always replace lines which are damaged.

## Material stress

Uncontrolled flight positions—such as may be encountered during safety training, extreme manoeuvres or after massive collapses or cascades—are outside the manufacturer limits of the paraglider. This may cause a general deterioration in flight characteristics, premature ageing, or even structural failure.





**WARNING** Uncontrolled flight positions are outside the manufacturer limits of the paraglider. This may cause a general deterioration in flight characteristics, premature ageing, or even structural failure.

## Repairs

### Gin Gliders workshops

All repairs and servicing should be carried out by a Gin Gliders authorised workshop or directly by Gin Gliders. Gin Gliders workshops have trained staff, original Gin Gliders parts and the necessary know-how, all of which will ensure top quality.

Major repairs at the Boomerang 10, such as replacing panels, should only be carried out by the distributor or manufacturer.

### Small repairs to the glider

Very small holes in the sail can be repaired with the sticky back tape provided with your glider. Damaged lines should be replaced by your GIN dealer. Before fitting a replacement line, check it for length against its counterpart on the other side of the wing. When a line has been replaced, always inflate the glider on flat ground to check that everything is in order before flying.

## 6. Dimensions, illustrations, technical and CCC data

### Description

The Boomerang 10 is a high performance competition wing designed from the outset for CIVL Competition Class certification. It is highly optimized to achieve the maximum performance available from a CCC glide, offering outstanding security, excellent glide and stability at all speeds and outstanding sink rate and climb combined with precise and dynamic handling. The Boomerang 10's precise handling allows the pilot to maximize climb rate in thermals, and the high cruising speed with great glide and stability allows the maximum possible average speed around cross country tasks.

The Boomerang 10 is optimized to go further in cross country and to win competitions, that optimization requires it to be extremely effective in all aspects of cross country thermal soaring, equally at home climbing in weak or strong thermals, racing along thermic ridges, gliding at high speed across still alpine valleys, or searching for elusive flatland thermals.

### Cutting-edge Design

The Boomerang 10 has been designed based on the experience we have gained from Gin's continuous development program, starting as soon as the Boomerang9 was released. That 2 year development program has resulted in a Boomerang 10 that is an improvement over the Boomerang9 in all areas of flight performance. The Boomerang 10 has better handling and better climb, better glide and better stability (particularly at speed), and because of that improved stability the Boomerang 10 has significantly higher certified top speed than the previous model.

These improvements result from a detailed analysis and deep understanding of the aerodynamic and structural loads within the sail in flight and better matching of materials and loads. This improved structural design applies both in the careful matching of cloth weight and stiffness to varying loads in different areas of the sail, and in the new rigifoil structure of the Boomerang 10. The structural improvements provide substantial rigidity at the leading edge, dramatically improving stability in turbulence, but they also allow a reduction in total line consumption, which leads to better glide, handling and climb.

These and other innovations make the Boomerang 10 the best glider available within the CIVL Competition Class.

### Manufacturing

All GIN gliders are produced in the company's own facilities using the most modern techniques. Highly skilled staff take extreme care during the entire manufacturing process. Stringent quality control is made after each step, and all materials that go into each wing can be traced. These measures guarantee that pilots fly with the assurance that their wing meets the most exacting safety standards.



## Overall illustration

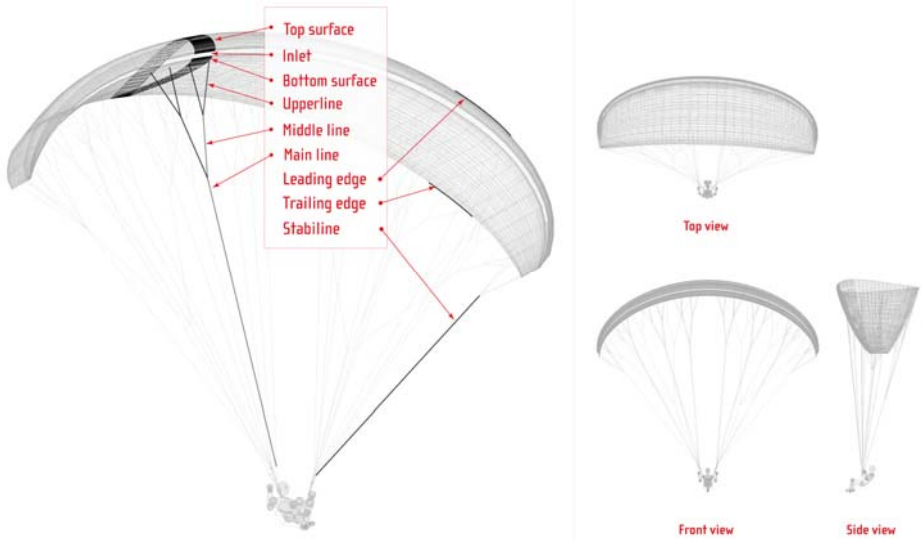


Fig. 5: Overall illustration

## Technical data

SIZE		S	M	L
FLAT	AREA [m <sup>2</sup> ]	21.7	23.6	25.5
	SPAN [m]	12.9	13.5	14.0
	A.R	7.7	7.7	7.7
PROTECTED	AREA [m <sup>2</sup> ]	18.6	20.2	21.9
	SPAN [m]	10.5	10.9	11.4
	A.R	5.9	5.9	5.9
CELL NUMBER		96	96	96
GLIDER WEIGHT [kg]		6.3	6.6	7.0
WEIGHT IN FLIGHT [kg]		85-100	100-115	110-125
Certification		CCC	CCC	CCC

## Riser and speed system

### Risers

The 12mm wide risers specially developed for the Boomerang 10 with Kevlar reinforcement allow the pilot to use a pulley system to adjust the speed of the Boomerang 10 to suit individual preference. All technical data and measurements are provided in the CCC 'Test-Lab-Template'.

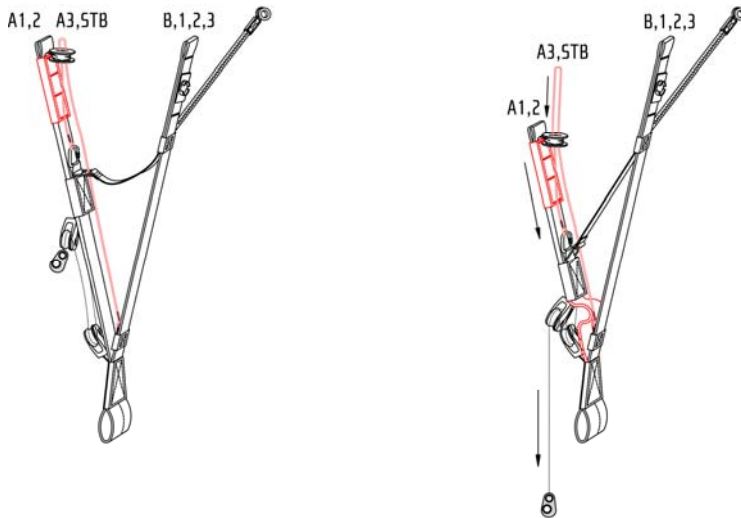


Fig. 6: Boomerang 10 riser

### Speed System

The speed system increases the maximum speed by lowering the angle of attack with a pulley-guided, foot-operated system. It is important to have your accelerator system correctly routed through your harness and attached to the risers with the supplied Brummel hooks. The length of the speed bar should be initially adjusted while on the ground, sitting in the harness so that the legs are fully extended at the point of full accelerator travel. It is helpful to have an assistant hold the risers taut while making this adjustment.

Under CCC rules the risers have to include a limiter between the main A riser and the B riser, to prevent acceleration beyond the certified top speed of the glider (the speed at which the glider passed the CCC high speed flight tests). Many top pilots find that the optimum speed system setup is to rig the system so that the limiters are just tight when the legs are comfortably fully extended (knees locked) on the top bar of the speed system (if multiple steps are used). This maximizes comfort and ensures that the speedsystem is symmetrically applied, and allows the pilot to keep the wing fully accelerated while using the B-risers to steer the wing and control pitch in turbulence.

Subsequent fine-tuning can be done on the ground following the first flight with the speed system. If in doubt about this procedure, consult your instructor or dealer.



## Line system, brakes and line plan

### Line system

The Boomerang 10 has A and B line levels, which fork two or three times from the bottom (riser) to the top (canopy) and which are divided into "Main", "Lower-Middle", "Higher-Middle" und "Top" lines. The individual line levels are connected with one another using the "handshake knot" (special hoop technology).

With the brake lines, the individual levels are bundled at the end with the main brake line. This runs through the brake ring attached to the riser and is knotted at the brake loop of the control handle. There is a mark on the main brake line which allows the control handle to be correctly positioned.

The main lines are all attached to Maillon quick links. They are fed through special elastic rings and attached to prevent the lines from slipping and to ensure that they sit in the correct position.

### Folding lines

Special folding lines were used when the Boomerang 10 was going through certification. Without these folding lines, asymmetric and symmetric collapses (tucks and frontals) may not behave or recover as they did in the CCC tests.

The folding lines have a special setting according to the CCC requirements. At the canopy, the folding lines are attached to special loops at the test model. At the lower end, their three main lines are attached to a special riser. Please contact Gin Gliders if you have any questions regarding use of the folding lines and riser.

### Brake line adjustment

#### Factory setting

The brake lines of the Boomerang 10 are set to the length that was used for the CCC certification test flights. These line lengths have been finely tuned by the GIN test pilots, and it should not be necessary to adjust them.

The brake line length is tuned so that there is slack in the brake lines when the glider is in fully accelerated flight. Therefore, the brakes are quite slack at trim speed, and to take up that slack in soaring flight, it is common to fly with half a wrap on the brakes and hold the handles on the knot. However, care should be taken to release the wraps in any extreme situation.

If you do need to make adjustments to suit your harness, body and flying style, we strongly recommend that you test fly the glider after every 2cm of adjustment. There should be a minimum of 10cm of free brake travel when the glider is flown hands-off. This prevents the brakes being applied unintentionally when the speed system is fully engaged. We recommend a double sheepshank or a bowline knot for the brake handle attachment as shown in the diagram.

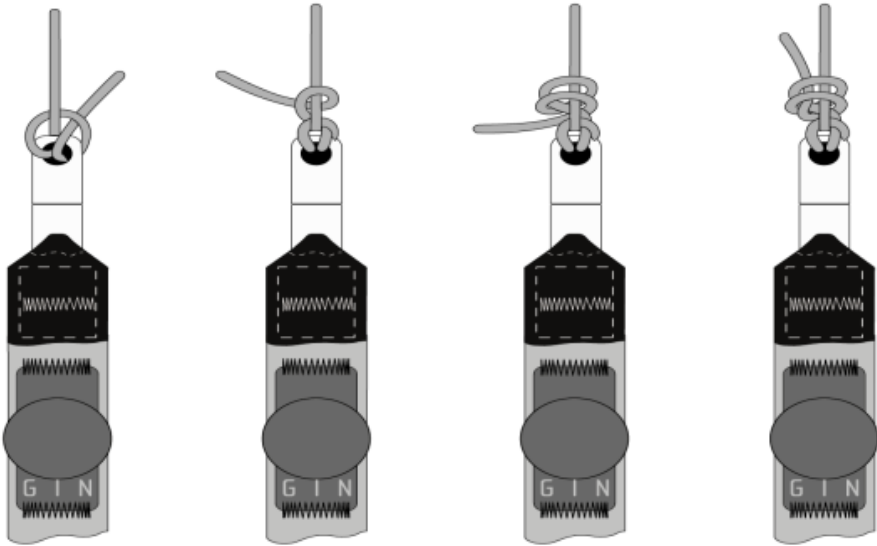


Fig. 7: Bowline knot

**WARNING** Loose, unsuitable or incorrectly tied brakeline knots can cause the main brake line to loosen and then lead to loss of control of the glider.

#### Incorrect adjustment

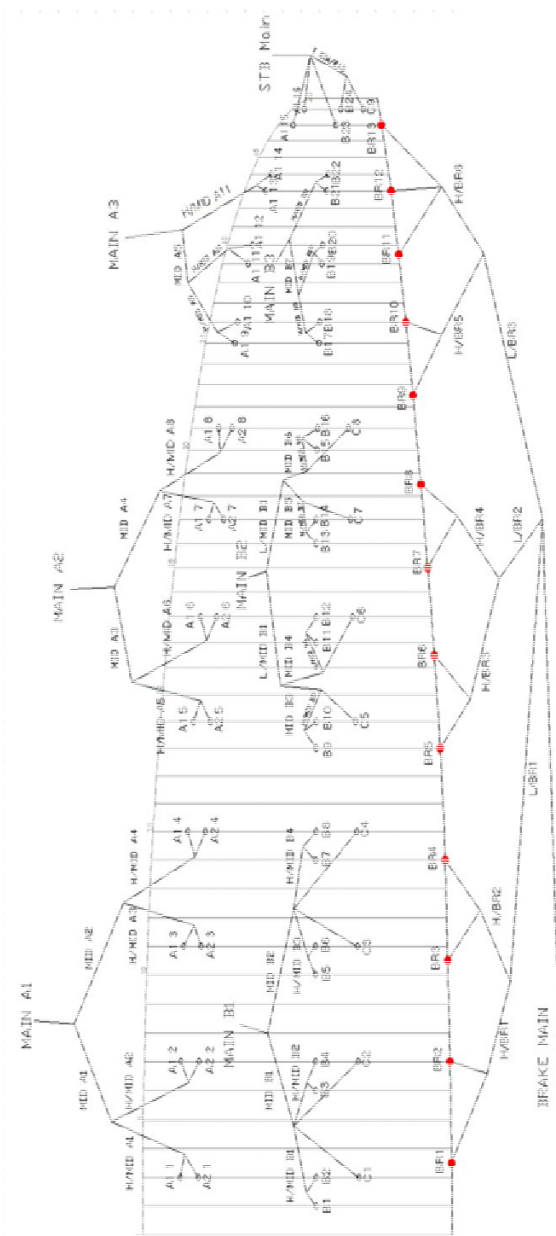
If the brake lines are too long, the paraglider reacts slowly and is difficult to land. The brake lines can be adjusted during flight by wrapping them around your hands which will improve the flight characteristics. Adjust the brake lines to the correct length after you have landed.

If the brakes are shortened, care must be taken that the paraglider is not slowed down in trim and accelerated flight. If the brake lines are too short, the following risks could arise:

- there could be an early stall
- the paraglider does not launch well and there is a risk of deep stall
- the paraglider exhibits dangerous behaviour in extreme flying
- the trailing edge of the paraglider is braked in accelerated flight which, in an extreme case, could cause a frontal collapse
- other safety issues may arise and performance may deteriorate



Line plan



# Material list



## Boomerang 10

### List of material

Rev. 1.0 | 2014-10-29

Description	Article Code	Material	Dimension	Finish	Manufacturer
Upper sail front	70032 E3W / 70000 E3H	Polyamid 6.6	32g/m <sup>2</sup> / 27g/m <sup>2</sup>	Coated, water repellent	Porcher Sport
Upper sail rear	70032 E3W	Polyamid 6.6	32g/m <sup>2</sup>	Coated, water repellent	Porcher Sport
Lower sail	70000 E3H	Polyamid 6.6	27g/m <sup>2</sup>	Coated, water repellent	Porcher Sport
Diagonal, loaded and unladen rib, half rib	9017 E29A / 70032E4D	Polyamid 6.6	40g/m <sup>2</sup> / 32g/m <sup>2</sup>	Coated, water repellent	Porcher Sport
H-Strap bands	9017 E29A	Polyamid 6.6	40g/m <sup>2</sup>	Coated, water repellent	Porcher Sport
Reinforcement I	9017E29A	Nylon	40g/m <sup>2</sup>	Coated, water repellent	Porcher Sport
Reinforcement II	140B HTP opti	Polyester	149g/m <sup>2</sup>	Coated, Polymer	Dimension Polyant
Rigid rods	-	Plastics	ø 2,0 - 3,0 mm	-	Gin Gliders Inc.
Top lines	8000/U-050 / 9200-030	Aramid / Dyneema	ø 0.5mm / ø 0.4mm	UV Protec coating	Edeleid
Middle lines I	8000/U-50, 070, 090, 130, 190	Aramid	ø [mm]: 0.5, 0.7, 0.8, 1.0, 1.2	UV Protec coating	Edeleid
Middle lines II	8000/U-50, 090, 130, 190, 230	Aramid	ø [mm]: 0.5, 0.8, 1.0, 1.2, 1.3	UV Protec coating	Edeleid
Middle lines III	8000/U-090, 130	Aramid	ø [mm]: 0.8, 1.0	UV Protec coating	Edeleid
Main lines I	8000/U-050, 190, 360	Aramid	ø [mm]: 0.5, 1.2, 1.7	UV Protec coating	Edeleid
Main lines II	8000/U-50, 190	Aramid	ø [mm]: 0.5, 1.2	UV Protec coating	Edeleid
Riser	02-/2mm BLK	Aramid & Polyester	12mm / 2mm	-	Cousin
Line: loop I	Plain Mil.-T 5038	Nylon	10mm	-	Seokwang
Line: loop II (brake)	Kite Handle Line	Dyneema	ø 1mm	-	Gin Gliders Inc.
Line: shackle (Carabiner)	Shackle	Stainless Steel	ø 3.85mm	-	JuTech Korea
O-Ring (Carabiner)	046801525 [Würth]	Perbunan 70	15mm x 2.5mm	-	Würth GmbH
Thread for fabric	Mill Faden 150D/3	Polyester bonded	0.05g	Impregnated	Amann & Söhne
Thread for riser	210D/4	Polyester bonded	0.07g	-	Wongang
Trailing Edge Band	140B HTP opti	Polyester	149g/m <sup>2</sup>	Coated, Polymer	Dimension Polyant
Binding Tape (Leading Edge)	10mm Tape	Nylon	10mm	-	Seokwang



GIN





## CCC Test-Lab-Template

All information concerning CCC requirements and process, including the list of CCC certified gliders, is now available here:

[www.fai.org/civl-our-sport/competition-class-paragliders](http://www.fai.org/civl-our-sport/competition-class-paragliders)

The following CCC-Test-Template is published for anyone to check the wings. We recommend to download the official file from the link above to make the template easier to understand.

## Size S

### Measurement request from test house for CCC certification From 28/09/2014 to next revision

Brand	Gin Gliders Inc.	Test house name	DHV
Model	Boomerang 10	CCC certification n°	DHV CCC-001-14
Size	S	Certification date	11.11.2014

#### Canopy dimensions

Position	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances	Aspect ratio 4*span / (chord A+2.5*Chord B)
Full Span	x	12690	3	2%	7,5083
1/2 Trailing Edge	x	6500	3	1%	
Chord A	1	2103	3	1%	
Chord B	20	1863	3	1%	

#### Chord length, inlet position, tabs position measured from trailing edge.

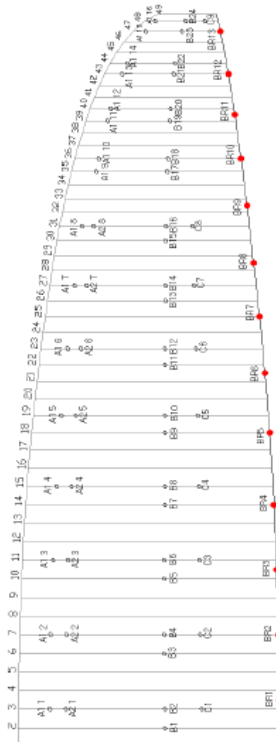
(The tab A & B & C can be on different rib, take care to specify it)

On first lined rib (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	2	2103	3	+/-10mm
Top of inlet	2	2047	3	+/-10mm
Bottom of inlet	2	2018	3	+/-10mm
Tab Aa*	3	1840	3	+/-10mm
Tab Ab*	3	1715	3	+/-10mm
Tab B*	2	906	3	+/-10mm
Tab C*	3	634	3	+/-10mm

On last lined rib of Group 2 (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	31	1517	3	+/-10mm
Top of inlet	31	1453	3	+/-10mm
Bottom of inlet	31	1431	3	+/-10mm
Tab Aa*	31	1327	3	+/-10mm
Tab Ab*	31	1237	3	+/-10mm
Tab B*	31	654	3	+/-10mm
Tab C*	31	459	3	+/-10mm

On last lined rib (stabilo) (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	48	595	3	+/-10mm
Tab A*	48	508	3	+/-10mm
Tab B*	48	266	3	+/-10mm
Tab C*	48	115	3	+/-10mm

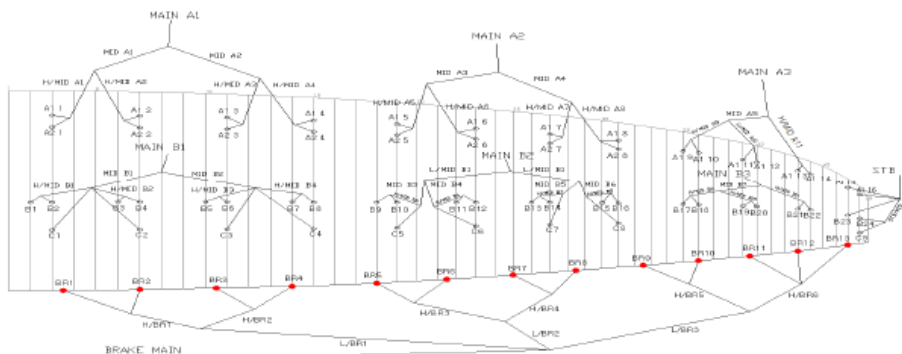
\*Bridle (tab) position measurement:  
end of trailing edge to center bridle (tab)





## Absolute line length from bottom riser to canopy

Lined Rib n°	A1	A2	B	C	Brakes	Tension [kg]	Manual tolerances
1	7.558	7.537	7.557	7.581	8.354	5	+/-10mm
2	7.428	7.409	7.503	7.479	8.129	5	+/-10mm
3	7.391	7.372	7.405	7.443	7.913	5	+/-10mm
4	7.449	7.432	7.399	7.528	7.941	5	+/-10mm
5	7.354	7.337	7.372	7.374	7.701	5	+/-10mm
6	7.221	7.205	7.384	7.271	7.575	5	+/-10mm
7	7.163	7.149	7.413	7.212	7.544	5	+/-10mm
8	7.185	7.175	7.452	7.258	7.604	5	+/-10mm
9	6.991		7.357	6.724	7.504	5	+/-10mm
10	6.943		7.302		7.450	5	+/-10mm
11	6.844		7.204		7.436	5	+/-10mm
12	6.834		7.200		7.491	5	+/-10mm
13	6.778		7.157		7.691	5	+/-10mm
14	6.777		7.143		5	+/-10mm	
15	6.617		7.187		5	+/-10mm	
16	6.588		7.195		5	+/-10mm	
17			6.978		5	+/-10mm	
18			6.930		5	+/-10mm	
19			6.835		5	+/-10mm	
20			6.827		5	+/-10mm	
21			6.767		5	+/-10mm	
22			6.768		5	+/-10mm	
23			6.635		5	+/-10mm	
24			6.622		5	+/-10mm	



### Riser length

From bottom riser to top maillon on each branche [mm]

A1	A2	B	$\Delta t$ (= A1-B)	Tension [kg]	Manual tolerances	Attachment rod diameter [mm]
520	520	520	0	5	+/-5mm	10

Full speed setting	Manual tolerances
$\Delta a$ (=B-A1)	145 +/-5mm
B-A2	72 +/-5mm
total speed Range ( $\Delta a + \Delta t$ )	145 +/-5mm

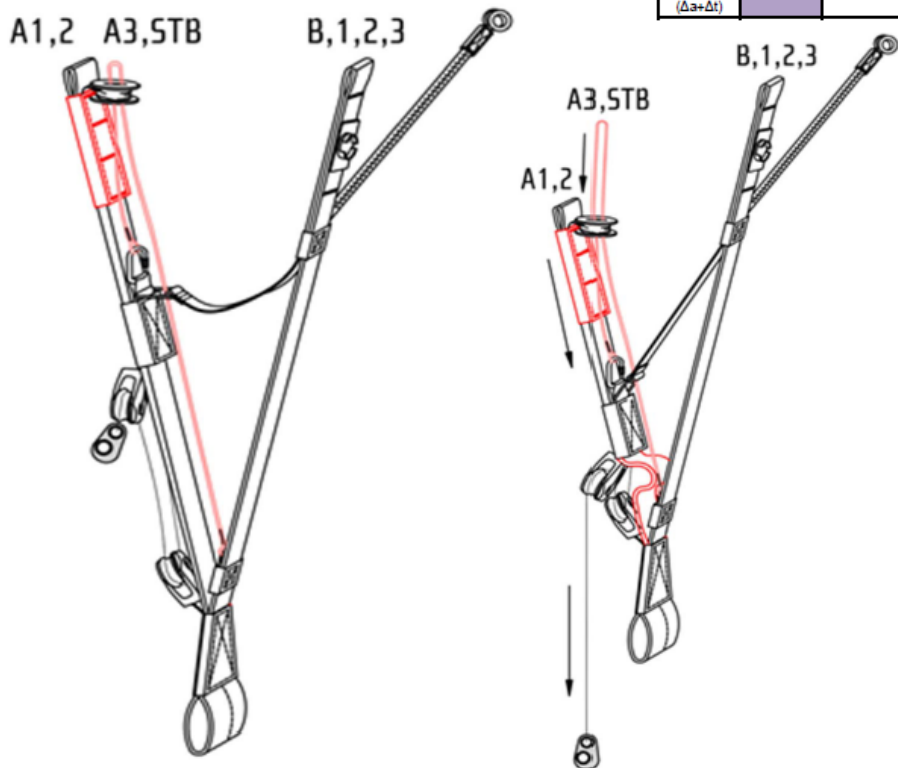




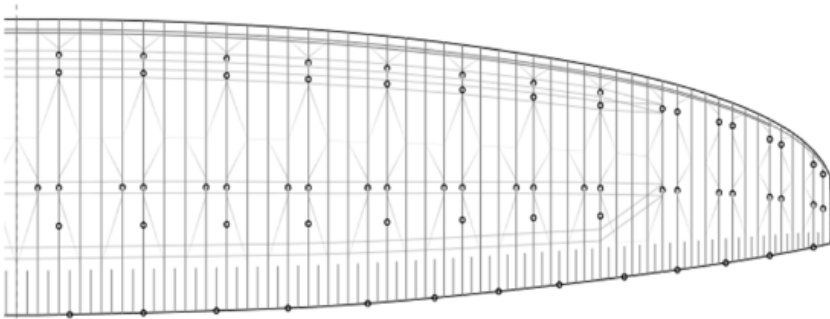
Table of lines quality

Upper										
	A1		A2		B		C		BR	
1	Edlerid	8000/U-130	Edlerid	8000/U-090	Edlerid		Edlerid		Edlerid	
2	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
3	Edlerid	8000/U-050	Edlerid		Edlerid		Edlerid		Edlerid	
4	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
5	Edlerid	8000/U-130	Edlerid	8000/U-050	Edlerid		Edlerid	9200-030	Edlerid	
6	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
7	Edlerid	8000/U-050	Edlerid		Edlerid		Edlerid		Edlerid	9200-030
8	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
9	Edlerid				Edlerid		Edlerid		Edlerid	
10	Edlerid				Edlerid				Edlerid	
11	Edlerid	8000/U-050			Edlerid	8000/U-050			Edlerid	
12	Edlerid				Edlerid				Edlerid	
13	Edlerid				Edlerid				Edlerid	
14	Edlerid				Edlerid				Edlerid	
15	Edlerid	9200-030			Edlerid					
16	Edlerid				Edlerid					
17					Edlerid					
18					Edlerid					
19					Edlerid					
20					Edlerid					
21					Edlerid					
22					Edlerid					
23					Edlerid					
24					Edlerid	9200-030				
					Edlerid					
H/middle										
	A				B				BR H/Middle	
1	Edlerid	8000/U-190			Edlerid				Edlerid	
2	Edlerid	8000/U-130			Edlerid				Edlerid	
3	Edlerid	8000/U-090			Edlerid				Edlerid	9200-030
4	Edlerid	8000/U-130			Edlerid				Edlerid	
5	Edlerid	8000/U-190			Edlerid				Edlerid	
6	Edlerid	8000/U-130			Edlerid	8000/U-050			Edlerid	
7	Edlerid	8000/U-090			Edlerid					
8	Edlerid	8000/U-130			Edlerid					
9	Edlerid	8000/U-090			Edlerid					
10	Edlerid	8000/U-070			Edlerid					
11	Edlerid	8000/U-050			Edlerid					
12					Edlerid	9200-030				
Middle										
	A				B				BR L/Middle	
1	Edlerid	8000/U-230			Edlerid	8000/U-130			Edlerid	8000/U-050
2	Edlerid	8000/U-190			Edlerid	8000/U-090			Edlerid	
3	Edlerid	8000/U-230			Edlerid	8000/U-130			Edlerid	
4	Edlerid	8000/U-190			Edlerid	8000/U-130				
5	Edlerid	8000/U-130			Edlerid	8000/U-090				
6					Edlerid	8000/U-050				
7					Edlerid	8000/U-050				
L/Middle										
					B					
1					Edlerid	8000/U-130				
2					Edlerid	8000/U-090				
Main										
	A				B				BR H/Main	
1	Edlerid	8000/U-360			Edlerid	8000/U-190			Edlerid	8000/U-090
2	Edlerid	8000/U-360			Edlerid	8000/U-190				
3	Edlerid	8000/U-190			Edlerid	8000/U-050				
STB H/Main	Edlerid	8000/U-050							Liros	PPSL160
STB L/Main	Liros	DSL70								

Upper and lower line loop reinforcement: all Edlerid 8000 lines have upper and lower reinforcement:

Other pictures & drawings requested from test House

Diagonals, Hstraps and Mini Ribs (top view)

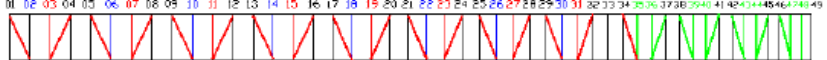


Diagonals (Front view)

Diagonal 1(A)



Diagonal 1(B) 뒤(2)



Diagonal 2



Vent (Inlet) shape



**Size M**
**Measurement request from test house for CCC certification**  
**From 28/09/2014 to next revision**

<b>Brand</b>	Gin Gliders Inc.	<b>Test house name</b>	DHV
<b>Model</b>	Boomerang 10	<b>CCC certification n°</b>	DHV CCC-002-14
<b>Size</b>	M	<b>Certification date</b>	11.11.2014

**Canopy dimensions**

Position	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances	Aspect ratio 4*span / (chord A+2.5*Chord B)
Full Span	x	13355	3	2%	7,5881
1/2 Trailing Edge	x	6805	3	1%	
Chord A	1	2190	3	1%	
Chord B	20	1940	3	1%	

**Chord length, inlet position, tabs position measured from trailing edge.**

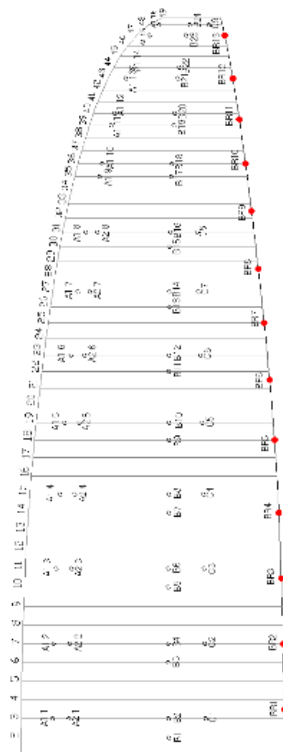
(The tab A &amp; B &amp; C can be on different rib, take care to specify it)

On first lined rib (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	2	2190	3	+/-10mm
Top of inlet	2	2136	3	+/-10mm
Bottom of inlet	2	2106	3	+/-10mm
Tab Aa*	3	1916	3	+/-10mm
Tab Ab*	3	1786	3	+/-10mm
Tab B*	2	943	3	+/-10mm
Tab C*	3	660	3	+/-10mm

On last lined rib of Group 2 (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	31	1576	3	+/-10mm
Top of inlet	31	1525	3	+/-10mm
Bottom of inlet	31	1505	3	+/-10mm
Tab Aa*	31	1382	3	+/-10mm
Tab Ab*	31	1288	3	+/-10mm
Tab B*	31	680	3	+/-10mm
Tab C*	31	478	3	+/-10mm

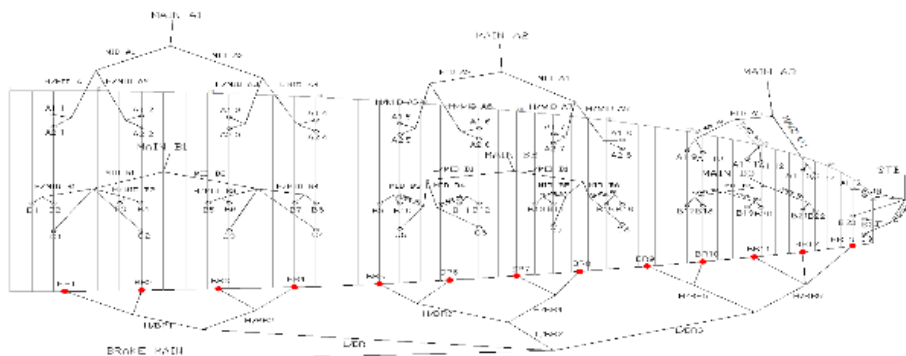
On last lined rib (stabilo) (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	48	619	3	+/-10mm
Tab A*	48	529	3	+/-10mm
Tab B*	48	277	3	+/-10mm
Tab C*	48	119	3	+/-10mm

\*Bridle (tab) position measurement:  
end of trailing edge to center bridle (tab)



**Absolute line length from bottom riser to canopy**

Lined Rib n°	A1	A2	B	C	Brakes	Tension [kg]	Manual tolerances
1	7.890	7.871	7.892	7.916	8.721	5	+/-10mm
2	7.758	7.738	7.836	7.809	8.486	5	+/-10mm
3	7.720	7.700	7.733	7.773	8.261	5	+/-10mm
4	7.781	7.783	7.727	7.862	8.290	5	+/-10mm
5	7.681	7.664	7.701	7.694	8.042	5	+/-10mm
6	7.544	7.527	7.692	7.588	7.911	5	+/-10mm
7	7.483	7.488	7.744	7.526	7.877	5	+/-10mm
8	7.505	7.496	7.784	7.571	7.939	5	+/-10mm
9	7.305		7.685	7.025	7.836	5	+/-10mm
10	7.254		7.629		7.779	5	+/-10mm
11	7.150		7.527		7.766	5	+/-10mm
12	7.139		7.523		7.823	5	+/-10mm
13	7.080		7.478		8.032	5	+/-10mm
14	7.079		7.463			5	+/-10mm
15	6.911		7.487			5	+/-10mm
16	6.879		7.516			5	+/-10mm
17			7.291			5	+/-10mm
18			7.240			5	+/-10mm
19			7.140			5	+/-10mm
20			7.132			5	+/-10mm
21			7.069			5	+/-10mm
22			7.067			5	+/-10mm
23			6.930			5	+/-10mm
24			6.927			5	+/-10mm







## Riser length

From bottom riser to top maillon on each branche [mm]

A1	A2	B	$\Delta t$ (= A1-B)	Tension [kg]	Manual tolerances	Attachment rod diameter [mm]
520	520	520	0	5	+/-5mm	10

Full speed setting	Manual tolerances
$\Delta a$ (=B-A1)	145 +/-5mm
B-A2	72 +/-5mm
total speed Range ( $\Delta a + \Delta t$ )	145 +/-5mm

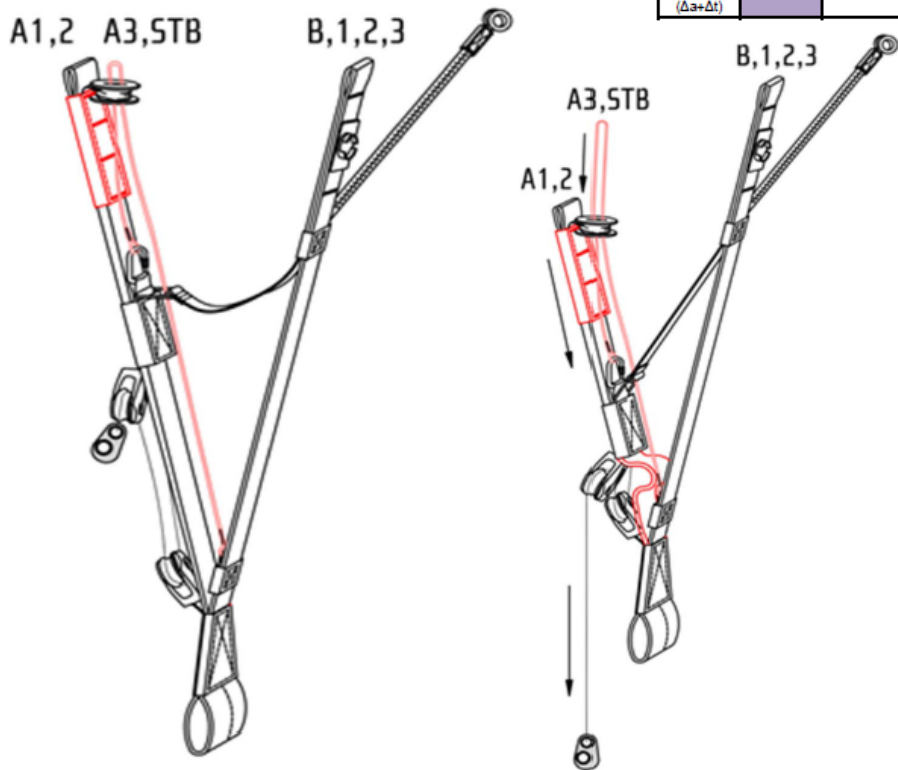




Table of lines quality

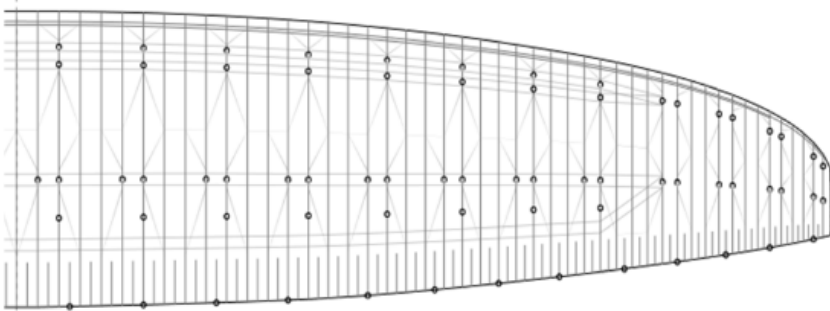
Upper										
	A1		A2		B		C		BR	
1	Edlerid	8000/U-130	Edlerid	8000/U-090	Edlerid		Edlerid		Edlerid	
2	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
3	Edlerid	8000/U-050	Edlerid		Edlerid		Edlerid		Edlerid	
4	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
5	Edlerid	8000/U-130	Edlerid	8000/U-050	Edlerid		Edlerid	9200-030	Edlerid	
6	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
7	Edlerid	8000/U-050	Edlerid		Edlerid		Edlerid		Edlerid	9200-030
8	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
9	Edlerid				Edlerid		Edlerid		Edlerid	
10	Edlerid				Edlerid				Edlerid	
11	Edlerid	8000/U-050			Edlerid	8000/U-050			Edlerid	
12	Edlerid				Edlerid				Edlerid	
13	Edlerid				Edlerid				Edlerid	
14	Edlerid				Edlerid				Edlerid	
15	Edlerid	9200-030			Edlerid					
16	Edlerid				Edlerid					
17					Edlerid					
18					Edlerid					
19					Edlerid					
20					Edlerid					
21					Edlerid					
22					Edlerid					
23					Edlerid					
24					Edlerid	9200-030				
					Edlerid					
H/middle										
	A				B				BR H/Middle	
1	Edlerid	8000/U-190			Edlerid				Edlerid	
2	Edlerid	8000/U-130			Edlerid				Edlerid	
3	Edlerid	8000/U-090			Edlerid				Edlerid	9200-030
4	Edlerid	8000/U-130			Edlerid				Edlerid	
5	Edlerid	8000/U-190			Edlerid				Edlerid	
6	Edlerid	8000/U-130			Edlerid	8000/U-050			Edlerid	
7	Edlerid	8000/U-090			Edlerid					
8	Edlerid	8000/U-130			Edlerid					
9	Edlerid	8000/U-090			Edlerid					
10	Edlerid	8000/U-070			Edlerid					
11	Edlerid	8000/U-050			Edlerid					
12					Edlerid	9200-030				
Middle										
	A				B				BR L/Middle	
1	Edlerid	8000/U-230			Edlerid	8000/U-130			Edlerid	8000/U-050
2	Edlerid	8000/U-190			Edlerid	8000/U-090				
3	Edlerid	8000/U-230			Edlerid	8000/U-130				
4	Edlerid	8000/U-190			Edlerid	8000/U-130				
5	Edlerid	8000/U-130			Edlerid	8000/U-090				
6					Edlerid	8000/U-050				
7					Edlerid	8000/U-050				
L/Middle										
					B					
1					Edlerid	8000/U-130				
2					Edlerid	8000/U-090				
Main										
	A				B				BR H/Main	
1	Edlerid	8000/U-360			Edlerid	8000/U-190			Edlerid	8000/U-090
2	Edlerid	8000/U-360			Edlerid	8000/U-190				
3	Edlerid	8000/U-190			Edlerid	8000/U-050				
STB H/Main	Edlerid	8000/U-050								
STB L/Main	Liros	DSL70							Liros	PPSL160

Upper and lower line loop reinforcement: all Edlerid 8000 lines have upper and lower reinforcement:



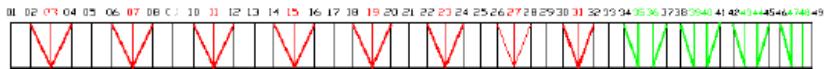
## Other pictures & drawings requested from test House

### Diagonals, Hstraps and Mini Ribs (top view)

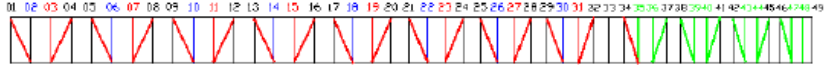


### Diagonals (Front view)

#### Diagonal 1(A)



#### Diagonal 1(B) 위쪽



#### Diagonal 2



### Vent (Inlet) shape



## Size L

### Measurement request from test house for CCC certification From 28/09/2014 to next revision

Brand	Gin Gliders Inc.	Test house name	DHV
Model	Boomerang 10	CCC certification n°	DHV CCC-003-14
Size	L	Certification date	11.11.2014

#### Canopy dimensions

Position	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances	Aspect ratio 4*span / (chord A+2.5*Chord B)
Full Span	x	13830	3	2%	7.5579
1/2 Trailing Edge	x	7075	3	1%	
Chord A	1	2277	3	1%	
Chord B	20	2017	3	1%	

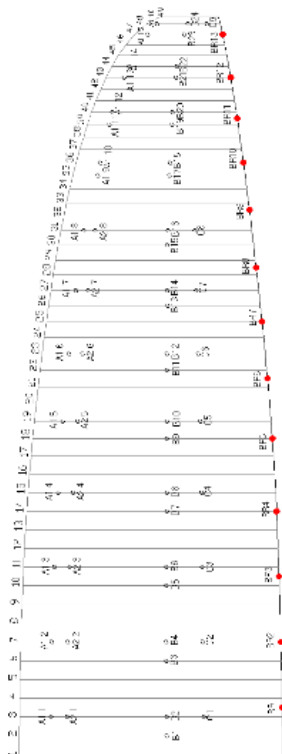
#### Chord length, inlet position, tabs position measured from trailing edge. (The tab A & B & C can be on different rib, take care to specify it)

On first lined rib (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	2	2277	3	+/-10mm
Top of inlet	2	2220	3	+/-10mm
Bottom of inlet	2	2190	3	+/-10mm
Tab Aa*	3	1992	3	+/-10mm
Tab Ab*	3	1857	3	+/-10mm
Tab B*	2	980	3	+/-10mm
Tab C*	3	686	3	+/-10mm

On last lined rib of Group 2 (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	31	1641	3	+/-10mm
Top of inlet	31	1584	3	+/-10mm
Bottom of inlet	31	1565	3	+/-10mm
Tab Aa*	31	1437	3	+/-10mm
Tab Ab*	31	1340	3	+/-10mm
Tab B*	31	707	3	+/-10mm
Tab C*	31	496	3	+/-10mm

On last lined rib (stabilo) (from center)	Rib n° from center	Distance [mm]	Tension [kg]	Manual tolerances
Chord	48	643	3	+/-10mm
Tab A*	48	560	3	+/-10mm
Tab B*	48	288	3	+/-10mm
Tab C*	48	124	3	+/-10mm

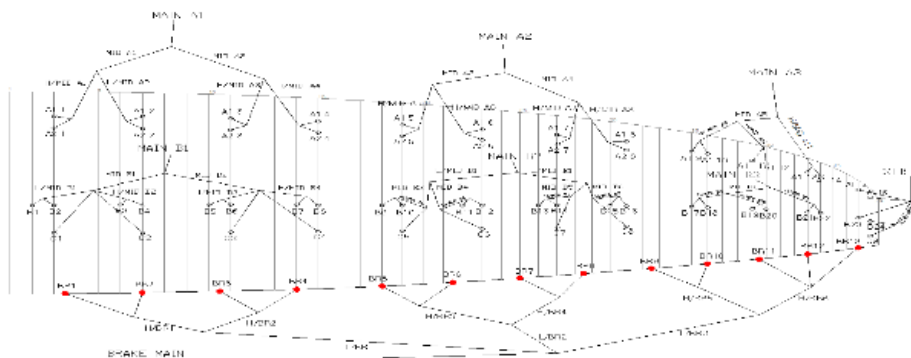
\*Bridle (tab) position measurement:  
end of trailing edge to center bridle (tab)





## Absolute line length from bottom riser to canopy

Lined Rib n°	A1	A2	B	C	Brakes	Tension [kg]	Manual tolerances
1	8.227	8.207	8.228	8.251	9.086	5	+/-10mm
2	8.090	8.069	8.170	8.142	8.843	5	+/-10mm
3	8.051	8.031	8.064	8.105	8.610	5	+/-10mm
4	8.118	8.098	8.058	8.199	8.640	5	+/-10mm
5	8.015	7.996	8.031	8.035	8.383	5	+/-10mm
6	7.871	7.854	8.022	7.924	8.247	5	+/-10mm
7	7.808	7.793	8.076	7.861	8.213	5	+/-10mm
8	7.833	7.822	8.118	7.908	8.278	5	+/-10mm
9	7.621		8.018	7.329	8.173	5	+/-10mm
10	7.568		7.960		8.114	5	+/-10mm
11	7.461		7.854		8.100	5	+/-10mm
12	7.450		7.850		8.160	5	+/-10mm
13	7.389		7.803		8.376	5	+/-10mm
14	7.388		7.787		5	+/-10mm	
15	7.214		7.813		5	+/-10mm	
16	7.180		7.843		5	+/-10mm	
17			7.608		5	+/-10mm	
18			7.555		5	+/-10mm	
19			7.450		5	+/-10mm	
20			7.442		5	+/-10mm	
21			7.378		5	+/-10mm	
22			7.377		5	+/-10mm	
23			7.233		5	+/-10mm	
24			7.219		5	+/-10mm	



**Riser length**

From bottom riser to top maillon on each branche [mm]

A1	A2	B	$\Delta t$ (= A1-B)	Tension [kg]	Manual tolerances	Attachment rod diameter [mm]
520	520	520	0	5	+/-5mm	10

Full speed setting	Manual tolerances
$\Delta a$ (=B-A1)	145 +/-5mm
B-A2	72 +/-5mm
total speed Range ( $\Delta a + \Delta t$ )	145 +/-5mm

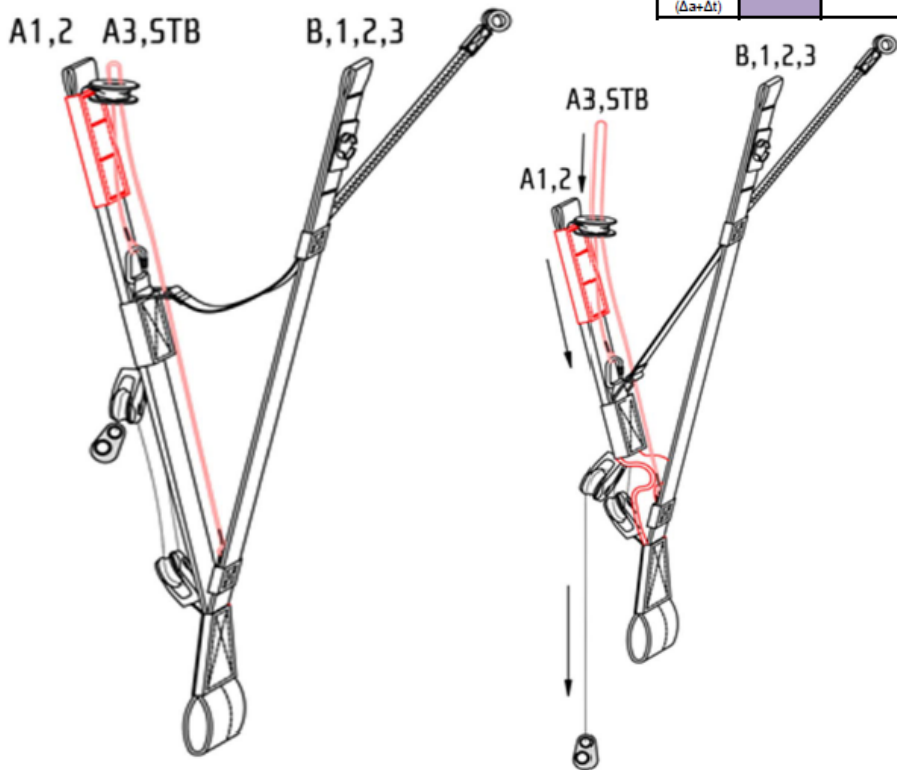




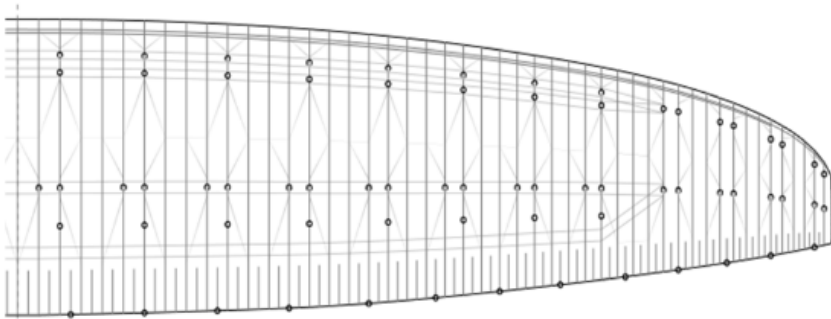
Table of lines quality

Upper										
	A1		A2		B		C		BR	
1	Edlerid	8000/U-130	Edlerid	8000/U-090	Edlerid		Edlerid		Edlerid	
2	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
3	Edlerid	8000/U-050	Edlerid		Edlerid		Edlerid		Edlerid	
4	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
5	Edlerid	8000/U-130	Edlerid	8000/U-050	Edlerid		Edlerid	9200-030	Edlerid	
6	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
7	Edlerid	8000/U-050	Edlerid		Edlerid		Edlerid		Edlerid	9200-030
8	Edlerid	8000/U-070	Edlerid		Edlerid		Edlerid		Edlerid	
9	Edlerid				Edlerid		Edlerid		Edlerid	
10	Edlerid				Edlerid				Edlerid	
11	Edlerid	8000/U-050			Edlerid	8000/U-050			Edlerid	
12	Edlerid				Edlerid				Edlerid	
13	Edlerid				Edlerid				Edlerid	
14	Edlerid				Edlerid				Edlerid	
15	Edlerid	9200-030			Edlerid					
16	Edlerid				Edlerid					
17					Edlerid					
18					Edlerid					
19					Edlerid					
20					Edlerid					
21					Edlerid					
22					Edlerid					
23					Edlerid					
24					Edlerid	9200-030				
					Edlerid					
H/middle										
	A				B				BR H/Middle	
1	Edlerid	8000/U-190			Edlerid				Edlerid	
2	Edlerid	8000/U-130			Edlerid				Edlerid	
3	Edlerid	8000/U-090			Edlerid				Edlerid	9200-030
4	Edlerid	8000/U-130			Edlerid				Edlerid	
5	Edlerid	8000/U-190			Edlerid				Edlerid	
6	Edlerid	8000/U-130			Edlerid	8000/U-050			Edlerid	
7	Edlerid	8000/U-090			Edlerid					
8	Edlerid	8000/U-130			Edlerid					
9	Edlerid	8000/U-090			Edlerid					
10	Edlerid	8000/U-070			Edlerid					
11	Edlerid	8000/U-050			Edlerid					
12					Edlerid	9200-030				
Middle										
	A				B				BR L/Middle	
1	Edlerid	8000/U-230			Edlerid	8000/U-130			Edlerid	8000/U-050
2	Edlerid	8000/U-190			Edlerid	8000/U-090			Edlerid	
3	Edlerid	8000/U-230			Edlerid	8000/U-130			Edlerid	
4	Edlerid	8000/U-190			Edlerid	8000/U-130				
5	Edlerid	8000/U-130			Edlerid	8000/U-090				
6					Edlerid	8000/U-050				
7					Edlerid	8000/U-050				
L/Middle										
					B					
1					Edlerid	8000/U-130				
2					Edlerid	8000/U-090				
Main										
	A				B				BR H/Main	
1	Edlerid	8000/U-360			Edlerid	8000/U-190			Edlerid	8000/U-090
2	Edlerid	8000/U-360			Edlerid	8000/U-190				
3	Edlerid	8000/U-190			Edlerid	8000/U-050				
STB H/Main	Edlerid	8000/U-050								
STB L/Main	Liros	DSL70							Liros	PPSL160

Upper and lower line loop reinforcement: all Edlerid 8000 lines have upper and lower reinforcement:

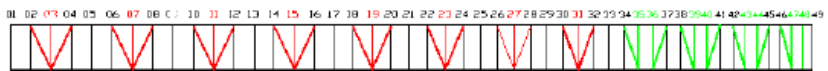
Other pictures & drawings requested from test House

Diagonals, Hstraps and Mini Ribs (top view)

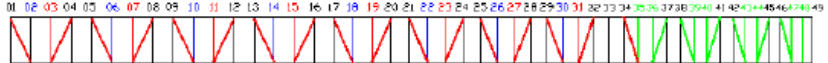


Diagonals (Front view)

Diagonal 1(A)



Diagonal 1(B) 위2



Diagonal 2



Vent (Inlet) shape







## Appendix

### Addresses

#### **Gin Gliders Inc.**

285-1 GalDam-Ri, Mohyun-Myun  
Yongin City, Kyunggi-Do  
449-851 Korea  
Fon: +82-31-333-1241  
Fax: +82-31-334-6788  
[www.gingliders.com](http://www.gingliders.com)

#### **DHV**

Miesbacher Str. 2  
Postfach 88  
83701 Gmund am Tegernsee  
Germany  
Fon: +49 (0) 8022 9675 - 0  
Fax: +49 (0) 8022 9675 - 99  
Email: [dhv@dhv.de](mailto:dhv@dhv.de)  
[www.dhv.de](http://www.dhv.de)

#### **FAI - Fédération Aéronautique Internationale**

Maison du Sport International  
Av. de Rhodanie 54  
1007 Lausanne  
Switzerland  
Fon: +41 21 345 1070  
Fax: +41 21 345 1077  
[www.fai.org](http://www.fai.org)

#### **Air Turquoise SA**

Route du Pré-au-Comte 8  
1844 Villeneuve  
Switzerland  
Fon: +41 219 65 65 65  
Fax: +41 219 65 65 68  
[www.para-test.com](http://www.para-test.com)

#### **EAPR**

European Academy of Parachute Rigging  
Marktstr. 11  
87730 Bad Grönenbach  
Germany  
Fon: +49 (0) 8334 - 534470  
Fax: +49 (0) 8334 - 534469  
Email: [info@para-academy.eu](mailto:info@para-academy.eu)  
[www.para-academy.eu](http://www.para-academy.eu)

#### **DULV**

Mühlweg 9  
71577 Großerlach-Morbach  
Germany  
Fon +49 (0) 7192 93014 - 0  
Email: [info@dulv.de](mailto:info@dulv.de)  
[www.dulv.de](http://www.dulv.de)

## Glider details

Size:	Colour:	Serial number:
Check flight (date): _____		
Mark and signature: _____		

## Pilot details / Proof of ownership

1. Owner	
Name:	
Address:	
Phone:	
Email:	
2. Owner	
Name:	
Address:	
Phone:	
Email:	
3. Owner	
Name:	
Address:	
Phone:	
Email:	



**Inspections and repairs overview**

Date	Work carried out	General condition on delivery	Completed by (Name)	Stamp and signature

# Notes

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---



More about Gin Gliders Inc.

[gingliders.com](http://gingliders.com)



G I N

Gin Gliders Inc.

285-1 Galdam-Ri, Mohyun-Myun, Yongin-City, Kyunggi-Do, Korea  
[www.gingliders.com](http://www.gingliders.com), [gin@gingliders.com](mailto:gin@gingliders.com)