



**MANUAL**

# ***TWICE***

***“GET IN TOUCH”***

**LTF 1-2**

Version: 1.6 – E, Stand: 09.06.2010

**Fly & more Handels GmbH ICARO Paragliders**  
**Hochriesstraße 1, 83126 Flintsbach, Deutschland**

Telefon: +49-(0) 8034-909 700 Fax: +49-(0) 8034-909 701

Email: [office@fly-more.com](mailto:office@fly-more.com) Web: <http://www.icaro-wings.de>





**Fly & more Handels GmbH**  
Hochriesstraße 1  
83126 Flintsbach, Deutschland  
Telefon: +49 (0) 8034 909 700  
Telefax: +49 (0) 8034 909 701  
E- mail: office@fly-more.com  
Internet: www.icaro-wings.de

## **Manual**

ICARO „**TWICE**“, LTF 1-2

© Fly & more Handels GmbH, ICARO Paragliders

This manual was submitted to the German Hanggliding Association (DHV).

All technical data and instructions in this manual were drawn up with great care.

The company Icaro Paragliders cannot be made responsible for any possible errors in this manual.

Any important changes to this manual will be published in „DHV INFO“, which is the official magazine of the DHV.

## LIST OF CONTENTS

---

<b>I.</b>	<b><u>YOUR <i>TWICE</i></u></b> .....	<b>6</b>
	CHARACTERISTICS OF YOUR <i>TWICE</i> .....	6
	TECHNICAL DATA .....	6
	CANOPY .....	6
	LINE MATERIAL .....	7
	RISERS .....	7
	CERTIFICATION .....	8
<b>II.</b>	<b><u>FLIGHT TIPS</u></b> .....	<b>8</b>
	PRE FLIGHT CHECK AND FLIGHT PREPARATION .....	8
	ATTACHMENT POINTS ON THE TANDEM SPREADER .....	9
	LAUNCH .....	9
	TURNING .....	9
	LANDING .....	10
	ACCELERATION (WITH TRIMMER ON RISER) .....	10
	TOWING .....	10
	THERMALS AND FLYING IN TURBULENCES: "ACTIVE FLYING" .....	11
<b>III.</b>	<b><u>DESCENT TECHNIQUES</u></b> .....	<b>11</b>
	SMALL AND BIG EARS.....	11
	B-LINE-STALL .....	12
	SPIRAL DIVE .....	12
<b>IV.</b>	<b><u>FLIGHT INCIDENTS</u></b> .....	<b>13</b>
	DEEP / PARACHUTE STALL .....	13
	ASYMMETRIC COLLAPSE .....	13
	SYMMETRIC COLLAPSE .....	13
	CRAVAT .....	13
	NEGATIVE SPIN.....	14
	FULL STALL .....	14
	EMERGENCY STEERING.....	14
<b>V.</b>	<b><u>SERVICE, REPAIRS AND MAINTENANCE</u></b> .....	<b>15</b>
	CARE INSTRUCTIONS.....	15
	HOW TO PACK YOUR GLIDER.....	15
	REPAIRS .....	16
	INSPECTION, PREREQUISITES AND PERSONAL QUALIFICATION .....	16
	INSPECTION INSTRUCTIONS .....	16
	INSPECTION REFERENCE.....	17
<b>VI.</b>	<b><u>TERMS OF THE GUARANTEE</u></b> .....	<b>18</b>
	WHAT IS COVERED BY THE GUARANTEE? .....	18
	HOW LONG IS THE GUARANTEE? .....	18
	WHAT ARE THE CONDITIONS OF THE GUARANTEE? .....	18
	WHAT IS EXCLUDED FROM THIS GUARANTEE? .....	19
	HOW CAN I CLAIM GUARANTEE? .....	19
<b>VII.</b>	<b><u>ENVIROMENTAL ASPECTS</u></b> .....	<b>19</b>
<b>VIII.</b>	<b><u>ATTITUDE AND BEHAVIOUR TOWARDS NATURE</u></b> .....	<b>19</b>
<b>IX.</b>	<b><u>LAST BUT NOT LEAST</u></b> .....	<b>20</b>
	APPENDIX: GUARANTEE CARD, CERTIFICATION, AIRBORNE SPORTS EQUIPMENT, LINEPLAN .	21



***Congratulations on buying your  
TWICE and welcome to the family  
of ICARO- Tandempilots!***

This paraglider was produced with great care so that you can enjoy many flights.

In order for you to feel comfortable with your paraglider right from the start, we recommend that you read this manual.

Apart from flight information, this manual also contains important safety instructions. You must get to know your paraglider well.

This manual also contains important care and operating instructions which are vital for your safety and preservation of your paraglider.

Should you decide to sell this paraglider at a later date, please pass on this manual to the new owner.

## IMPORTANT INSTRUCTIONS FOR USING AN ICARO PARAGLIDER

- THE USE OF THIS PARAGLIDER IS ENTIRELY AT YOUR OWN RISK. EVERY PILOT BEARS THE RESPONSIBILITY OF HIS/HER OWN SAFETY.
- EVERY PILOT MUST DO A THOROUGH PRE FLIGHT CHECK BEFORE EVERY FLIGHT AND MUST ENSURE THAT THE PARAGLIDER IS PROPERLY CHECKED AT REGULAR INTERVALS.
- THIS PARAGLIDER HAS BEEN CERTIFIED AND BUILT IN COMPLIANCE WITH DHV RULES AND REGULATIONS.
- DO NOT CHANGE THE CONFIGURATION OF YOUR GLIDER. IF YOU DO, YOU WILL LOSE YOUR DHV CERTIFICATION.
- EVERY PILOT IS RESPONSIBLE FOR THE SAFE OPERATING CONDITION OF HIS/HER PARAGLIDER!
- IT IS A PREREQUISITE THAT EACH PILOT IS IN POSSESSION OF A VALID PILOTS LICENCE.
- THE MANUFACTURER WILL NOT ACCEPT ANY CLAIMS!

### **IT IS STRICTLY PROHIBITED TO FLY THE *TWICE***

- WITH INSIGNIFICANT TRAINING AND EXPERIENCE OF THE PILOT
- OUTSIDE THE DHV SPECIFIED WEIGHT RANGE
- IN RAIN, SNOWFALL, CLOUDS OR FOG
- IN TURBULENT WEATHER CONDITIONS
- WITH ROLL ANGLES EXCEEDING 90°
- ACROBATICS

## I. Your **TWICE**

---

### **Characteristics of your TWICE**

Finest handling and simple start procedure (also no problem with little wind and flat gradient conditions) are probably the most outstanding characteristics of the new ICARO tandem. This is due to its short lines and wing form. Its adapted profile thickness along the length of the wing makes it light and efficient.

Manoeuvrable as a single seater, it can turn in the thermals and makes for pleasurable flights for two. It comes complete with trimmers and has a take off weight of 140-225 kg, Twice covers a large weight area and is optimal for professional tandem pilots.

The **TWICE** is convincing with its aesthetic form, and at the same time its aerodynamic qualities and passive safety.

### **Technical Data**

<b>TWICE</b> get in touch		
Wing area (flat)	m <sup>2</sup>	42,25
Wing area (projected)	m <sup>2</sup>	33,08
Wing span (flat)	m	15,20
Wing span (projected)	m	11,90
Aspect ratio	A/R	5,47
Cells		50
Take off weight (trimmer open)	kg	140 to 185
Take off weight (trimmer closed)	kg	160 to 225
Speed min.	km/h	42
Speed max.	km/h	-50
Number of risers		4+1
Weight	kg	10
Certification	LTF	1-2

### **Canopy**

Porcher Marine NCV 9017 is the material used in making the **TWICE**. Selected for its durability and resistance to UV-damage, it minimises air permeability and weight.

The profile of the **TWICE** was developed by our designer team in an intensive and complex process with many practical attempts. Different profiles along the complete wing optimise take off lift distribution. This is one of the reasons for the balanced combination of performance and flight stability.

The leading edge of a paraglider is an important aspect in designing a paraglider. **TWICE** has an exactly defined, evenly formed leading edge optimally coordinated in size and position along the canopy. The reinforcement of the leading edge gives stability in critical situations and plays an important part in easy inflation at the start and fast opening in turbulent conditions.

The use of extensive internal v-ribs makes the canopy more stable, especially in turbulence and maintains a tensioned wing profile. This causes the load to be distributed more evenly throughout the glider allowing for an increase in aspect ratio while simultaneously reducing the number of line attachment points.

The brake lines are attached so that the glider has very good handling, even in extreme situations and balances any overreaction by the pilot.

### **Line Material**

All lines are attached and sewn with precision. The lines of every ICARO paraglider are measured and documented before delivery.

The clever line gallery of the **TWICE** give this paraglider maximum safety with excellent take-off and flight behaviour. Wind resistance is reduced to a minimum.

### **Risers**

**TWICE** has 4-fold risers which are equipped with a trimmer system and a B-Line-Stall aid . Small and big ears are simplified by the separation of the A-harness.

Important aspects in the development of this harness were easy start behaviour, B-line-stall, controllability with the D-harness, exact optimised geometry of accelerated flight (open trimmer) as well as high weight specific stability.



B-Line-Stall aid



Trimmer open



Trimmer closed

## **Certification**

Following our philosophy to only build gliders with the highest safety, we design our gliders to meet DHV strict and robust regulations.

The **TWICE** has been developed and authorised with harnesses according to the LTF type "GH". Nearly all harnesses recently produced are type GH harnesses and suitable for the **TWICE**.

They differ from the GX harness due to their low suspension and not very effective (if at all included) cross straps. Cross straps have not proven themselves in combination with modern paragliders.

## **II. FLIGHT TIPS**

---

### ***Pre flight check and flight preparation***

It is important to perform a pre flight check before taking off. Please give the following points your special attention:

- Whilst unfolding your paraglider check the canopy and cell walls for damage. Always take into consideration that the paraglider may have become damaged during transportation.
- Check the lines for knots, twisting and damage.
- Also check the brake lines for knots and kinks. Check the main brake lines. They must be symmetric. The correct length of the main brake line must not be altered.
- Check your harness, the spreader bar, your passengers harness and make sure that all connections to pilot and passenger are correctly closed.
- Check that all karabiners are closed and can not be opened accidentally in flight and that the risers are not twisted.
- Check the position of the trimmer on both risers.
- Please ensure that both you and your passenger are wearing gear which offers both optimal comfort and protection (helmet with chin protection, boots, gloves and an overall).

After you have unpacked the wing and have laid it out in an arc form please go through the following points:

- The **TWICE** should be laid out so that when you pull up with the A risers, the middle lines should be under tension before those on the outside. This makes the start easier.
- Check the direction of the wind so that when pulling up, both halves of the paraglider are filled symmetrically. Separate the line groups and get the risers in order.
- Check that there are no tangles or knots in the lines. It is important that the brake lines are not tangled and cannot get caught by anything during take off.

- Check that the risers are not twisted, and then the brake lines run freely through the roll on the D risers to the back of the canopy.
- Pay attention that there no cravat at the start. This can have serious consequences.

### ***Attachment points on the tandem spreader***

The attachment for the risers is loop number 1.

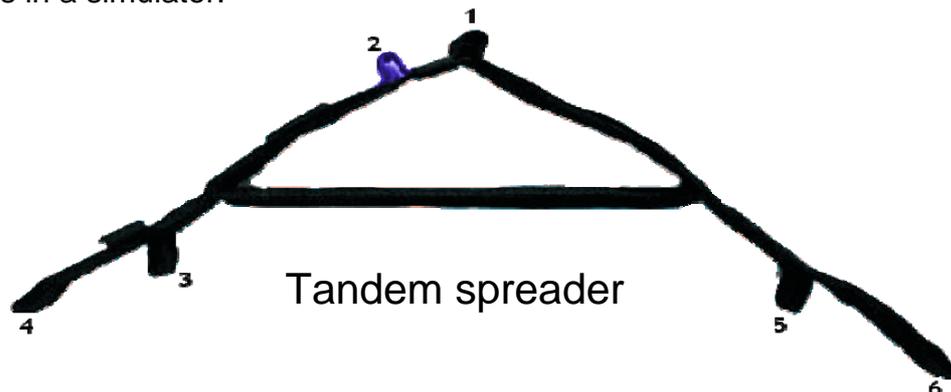
The connection belt of the rescue system should be hung in the blue loop 2.

As an alternative, for flights where there is a large difference in weight between pilot (heavy) and passenger (lighter than pilot), the blue loop 2 can be used for the risers to hang in. In this case, the rescue system must be connected to loop 1.

According to the harness and body size, the pilot hangs up onto loop 3 or 4 and the passenger is hung onto loop 5 or 6.

The choice of the optimal hook up point is dependant on the type of harness used and also the weight and body size of both the pilot and passenger.

In order to find the optimal hook up points, we recommend that you try out different situations in a simulator.



### ***Launch***

The most important thing during the take-off is, like at all other gliders too, not the force but the constancy of the pull.

Hold the A risers and the handles of the brakes, after you have finished the obligatory pre flight check. Use progressive pressure on the A risers and the energy of your own body weight until the wing is fully inflated overhead. The canopy is inflated quickly due to the super short lines.

When there is no pull from the lines and the wing is overhead, use slight pressure on the brake. Look up and make sure that the canopy is fully inflated. After a few accelerating steps and at the same time let go of the brakes gently, you will take off with your passenger. Then use slight pressure again on the brakes to fly at a speed with minimal sink.

### ***Turning***

The **TWICE** is as agile as a solo wing and reacts fast and direct to the smallest steering impulse. Shallow turns with minimal height loss and steep turns with maximum height loss are no problem for **TWICE**.

To make efficient and coordinated turns, use weight shifting and smooth application of the brakes. Excessive use of the inner brake might result in a spiral dive.

Strong, one sided pulling of the brakes brings the **IQ** into an obvious side angle and the glider flies fast and steep curves until spiral dive begins.

**Warning:** *If the brakelines are pulled too fast or too far the glider will be stalled! A one-sided stall is signaled clearly by: The curves´ inner side of the wing is getting soft, and nearly stops. In this case you have to release the brake-line!*

## **Landing**

The **TWICE** is very easy to land. In a straight landing manoeuvre, apply the brakes gently about 7 m above ground. After releasing the brakes the wing picks up speed and you fly 50 cm over the landing area and start to bring down the wing with the brakes. Landings where the passenger does not have to run are thus possible with no wind.

The stronger the headwind, the easier you must pull on the brakes. Please avoid landings when coming out of a turn or fast turning shortly before landing because of the pendulum movements this causes.

**Warning:** *Do not brake it too much, to avoid a stall of the glider in this very low altitude!!  
Do not reduce height by “pumping” with the brakes.  
Do not fly sharp turns or changing the direction while landing.  
Do not drop the canopy is on it´s nose after landing, that could damage the profiles of the glider.*

## **Acceleration (with trimmer on riser)**

Start off weight can be optimally adjusted by the position of the trimmer, and flight speed can be varied. Flight speed is increased by 6-7 km/ h when the trimmer is open. The **TWICE** remains stable when opening the trimmer.

If **TWICE** is flown at lowest take off weight in rain or extreme cold (from – 20°) then the trimmer should remain open.

The trimmer works as follows:

The difference between the A and D risers is +5 cm when the trimmer is open. This reduces the leading angle and increases speed. **TWICE** remains stable at high speed due to a specially adapted geometry of the trimmer.

## **Towing**

During the complete towing manoeuvre the trimmers of the **TWICE** must remain open. In the start phase make sure that the pull is gentle so that the pilot can take off at a flat angle. A towing force in excess of 120 kp is not permitted.

Towing is only allowed in Germany if both the pilot and the person towing have certification to do so. The winch must have an approved quality mark and has to be certified that it is suitable for towing paragliders.

Generally speaking, local rules and regulations must be observed and please ensure you use an experienced towing team and proper towing gear.

### ***Thermals and flying in turbulences: "Active Flying"***

We advise you to apply the brakes at all times whilst flying in turbulences. You hereby increase the opening angle and the wing is more stable. At the same time the pilot has a better feeling for the canopy via the brakes. When the pressure on the brakes decreases, then pull down more on the brakes for a short moment to avoid a possible collapse. According to the strength and length of turbulences this can be more than 100% of the brake path for a short time. Under normal conditions, with 100% of the brake path is the point where deep stall begins.

When flying into strong thermals please pay attention that the canopy does not remain behind the pilot. This is avoided by releasing the brakes when entering an up-wind to increase speed.

Vice versa the glider must be slowed down with the brakes if the canopy falls before the pilot when entering a down-wind or exiting a thermal. We recommend increasing speed when crossing a downwind or during headwind.

This type of flight technique is called "active flying". The pilot may roll his body with weight shift to move with the glider when the glider rolls to the right or left. These subtle adjustments keep the glider flying smoothly.

Due to its construction the **TWICE** has a very high built in stability but an active flight behaviour in turbulences – like described above – contributes significantly to the safety of pilot and passenger.

## **III. Descent Techniques**

---

**Warning: *Training of descent technics and simulation of flight incidents (SFI) should only take place at professional safety training seminars with professional trainer and only while flying over water.***

Use the manoeuvres Small/ Big ears with the trimmer, B-line-stall and spiral dive as ways of descending.

### ***Small and Big Ears***

The aim of this manoeuvre is to descend in strong thermals.

Take the outer A-risers of the **TWICE** in your hand, without releasing the brakes and pull down leaving it run through your hands (use gloves!). Sink rate increases to 5 m/ sec but not the forward speed.

Before landing, release the pulled down A-risers to achieve normal sink speed for a gentle landing. Keep the brakes in your hand. In this way, it is possible to fold in up to two thirds of the leading edge.

If you use a trimmer then sink speeds of 5m/sec can be achieved. Reopen the wing by pushing up with your hands and if necessary then pump the brakes with short symmetric movements. For directional control while using the big ears, you should use weight shift.

**Warning:** *The pitch angle of your paraglider is increased using small and big ears, the brake path is shortened and the risk of inducing a deep stall is high. Using trimmers during this manoeuvre helps to reduce these negative risks.*

### ***B-Line-Stall***

**TWICE** has a special B-line-stall aid which reduces the amount of strength needed to initiate the manoeuvre. From about 30 cm pull down on the loops attached to the B-risers, the Twice starts into a B-line-stall. Do not release the brake handles.

In a stable B-line-stall the glider will sink over 8 m/sec. To exit this manoeuvre release both loops on the B-riser quickly and simultaneously. **TWICE** will glide over smoothly to normal forward flight.

If forward flight does not resume, push gently forward with open palms on each A-riser – or open the trimmers (if closed).

**Warning:** *It is very dangerous to exit a B-line-stall incorrectly and following errors must be avoided:*

- *Exit is too slow*
- *Releasing the B-line-stall aid without simultaneously pushing up with your hands*
- *Using brakes during or directly after exiting*
- *Pulling too far on the B-line-stall aid, so that the A-lines are pulled too*
- *Brakes must not be shortened by twisting around your hand during the manoeuvre*

### ***Spiral Dive***

To initiate a spiral dive, look in the direction you want to go, roll your body weight in that direction and at the same time smoothly pull down on the inside brake. The **TWICE** will start to turn, speed up and then drop into a spiral.

To keep the wing under control you must pull and release the inside brake. Safe decent rates of 7-9 m/sec are possible. Please ensure that you have enough distance to the ground to exit the spiral dive.

Please exit slowly. Bring your body weight back to a neutral position and as soon as the wing levels out, apply the brakes gently. This procedure should be done slowly and will take a couple of turns to complete.

The **TWICE** does not have a tendency for stable spiral dive. If under certain conditions, it should go into a stable spiral dive then actively exit the manoeuvre by bringing your weight into a neutral position, release the brakes of the inner curve side and brake gently on the outer curve side until you notice that the wing starts to level out. Then gently brake on the inside curve for several turns until normal flights returns.

**Warning:** *If you pull abruptly and too far on the brakes, the canopy may enter a negative spin. When entering a spiral dive keep the outer curve brake released.*

## IV. Flight Incidents

---

**Warning: Simulation of flight incidents (SFI) should only take place at professional safety training seminars with professional trainer and only while flying over water.**

For your safety, SFI training should only be conducted in a controlled environment: rescue boat in position, life jacket, well adjusted radio and reserve parachute.

### ***Deep / Parachute Stall***

Your **TWICE** has been carefully designed to resist entering deep stall. If you pull strongly on the rear risers then **TWICE** normally ends a deep stall independently when you release the rear risers.

Before exiting a deep stall please ensure that the brakes are fully released. Actively exit the deep stall by reaching up and push forward with both palms on both A-risers or pull on the risers.

### ***Asymmetric Collapse***

While flying in turbulent conditions it may occur that a portion of your glider deflates. This is normally not a critical situation and reinflation occurs quickly without any input from the pilot. However, just like in flying in turbulences, please pull gently on both brakes. Reinflation is speeded up by counteracting the turning movement of the canopy until normal forward flight return.

Then pump the brake line on the collapsed side. If you have a collapse when the trimmer is open, then pull on the trimmer according to the weight load.

### ***Symmetric Collapse***

A glider may collapse symmetrically when flying through sudden down draughts in a front stall or by pulling strongly on the A-risers. The leading edge collapses abruptly along the whole wing span. The pendulum movement is eased by applying the brakes and speeds up re-inflation. **TWICE** normally re-inflates promptly in a symmetric collapse without pilot input. Applying the brakes symmetrically will speed things up.

### ***Cravat***

This never occurred during any of our test flights. However, it could happen in rare circumstances that a part of the glider, particularly a wing tip, gets caught in its own lines (e.g. in extreme turbulences or an error in the visual line check of the canopy before take-off).

Large cravats result mainly in uncontrollable spiral dives. There are a few ways to try to rectify this situation:

- Try pumping on the side of the cravat
- Pull the stabilo line (the outermost B-line)
- Actively collapse the cravat side and release
- If all else fails, attempt a full stall – only if sufficient altitude remains.

**Warning: Freeing a cravat may be complicated, even for an experienced pilot. If you have exhausted all these options, you are uncertain**

***how to proceed and you do not have control over your glider and you are running out of altitude, immediately deploy your reserve parachute.***

### ***Negative Spin***

A negative spin should not happen in normal flight. However, spins are often performed in SFI training to experience the gliders limits and so that pilots have a better understanding of the safe range of brake use.

If the pilot abruptly applies full brake to one side of the glider while the other side is at zero brake, the faster side may fly around the braked and stalled side resulting in a spin.

Alternatively, if flying very slowly with almost full brakes on both sides, if one hand releases one brake suddenly, while the other continues with full brake, the glider may enter a negative spin.

To exit a spin with your **TWICE** just do “hands up” to release the brakes and the glider will return to normal flight.

### ***Full Stall***

To initiate a full stable stall, apply both brakes to maximum arm extension. If possible grasp the seat of your harness to assist keeping your arms locked.

**Warning: *It is imperative that the pilot fully completes this manoeuvre and holds on, as a premature release while the glider is still falling back may cause the glider to rapidly dive ahead past the pilot. There is a possibility of the pilot landing in or entangling in the glider.***

Do not –under any circumstances- release at this point. The glider will slow down and stall, falling quickly behind the pilot. Avoid the urge to release.

The pilot will swing back under the canopy and finally the canopy will stabilize to a full stall.

Once in a stable stall, the manoeuvre can be completed. Release the brakes just a little and let the glider fill until it regains shape. Then release the brakes fully and your **TWICE** will return to normal flight.

### ***Emergency Steering***

Should it no longer be possible to steer your **TWICE**, for example due to a broken line, the glider may be steered by gently pulling on either D-riser.

Handling will be more direct so be careful not to pull too hard. A good way to get practice is during ground handling.

## V. Service, Repairs and Maintenance

---

### **Care Instructions**

Even with good care and maintenance, just like any item exposed to the elements, your glider can wear out after a certain amount of use. This can change flight behaviour and safety. We recommend a regular safety inspection of the canopy and all lines.

- If you wish to clean your glider it is best to use warm water and a soft sponge. Store your glider in a dry and dark place, ideally between 5° and 30° Celsius. Do not store it near chemicals or petrol.
- If you will not fly for longer period, store the glider releasing all compression straps and take it out of its backpack so that the fabric is not compressed, creased or stretched.
- Avoid storing your glider for days at a time in a hot car.
- If the glider has become wet, lay it out so that air can get to all areas of the fabric.

**Warning: It may take several days for your glider to dry out completely especially the lines, which take longer than the fabric. Do not fold and store your glider prematurely if it not completely dry. The performance of a wet glider can change significantly.**

### **How to pack your glider**

- The glider should be laid out neatly, the lines sorted, the risers stowed away either at the trailing edge or at the leading edge. The pilot stands at the leading edge by the outspread glider and a helper at the trailing edge.
- Both start on the inner side and putting one lane onto the next pulling the end of the glider more and more to the middle. Like this the reinforcements can be put on top of each other without being flexed.
- The same is done on the opposite side. Like this only two lane wide packages are left.
- These are being folded on top of each other and beginning at the trailing edge during simultaneous pressing to get rid of any air. The first fold over of the package should be between 30cm and 50cm. This way the material of the lower- and upper sail will not be stressed at the same area.

**ICARO Paragliders recommend not rolling in the glider material since different strains apply to the material. Through folding this can be avoided.**

- The last fold is carried out at the side of the leading edge. This is wrapped in direction of the trailing edge and packed between the part which has been folded before. Please pay attention that the reinforcements aren't flexed.
- The compression band is being attached to the glider package crossways to the folding direction and fastened only to hold the glider gently.
- Afterwards put the package into the glider bag....ready!

In order to pack your glider in the same way as above without a helper :

Lay out your glider neatly, sort your lines and stow away your risers either at the trailing edge or at the leading edge. You begin at the trailing edge and fold these together. Like this the glider lays fan-shaped in front of you. Now you put the leading edge on top without flexing it and carry on folding the glider, as described above.

### ***Repairs***

Small holes in the canopy can be repaired by the pilot by using self adhesive sailcloth on both sides of the perforation.

Damage to the lines or any other repairs should only be carried out at an authorized ICARO centre. If your **TWICE** needs to be repaired, please contact your local ICARO Paragliders dealer.

### ***Inspection, Prerequisites and Personal qualification***

After 200 flight hours or 24 months, it is important to have your **TWICE** inspected by a trained ICARO technician. Tandem gliders must be checked annually when used for commercial purposes.

Without regular certified inspections, your glider will lose its certification and guarantee.

You will need the following items in order to perform a paraglider inspection:

- Standardized inspection report
- Porosity meter
- Spring scale
- Equipment for measuring line lengths
- Equipment for line strength testing
- Sewing machine
- Big, clean and bright room

Technical specifications about your glider (type, serial number, size and year of production). Please call Fly & More Handels GmbH ICARO Paragliders for information.

A three week course at Fly & More GmbH, specified to a glider type together with a legal flight license are the necessary prerequisites for permission to inspect ICARO Paragliders. For questions about the costs and times of paragliding inspection courses please contact Fly & More Handels GmbH ICARO Paragliders.

### ***Inspection Instructions***

#### **Record Information**

Spread out your paraglider in a big bright room and make a note of information such as model, type and serial number.

#### **Porosity Test**

Use your porosity meter to perform porosity checks at 4 different places of the canopy. The results are recorded in the inspection protocol and are to be evaluated according to the internal guidelines of the workshop.

### **Visual Control of the Canopy**

Hang up the canopy so that you can do a visual check of your canopy. Check for perforations in the upper and lower sailcloth, damaged stitching between the cells, and damage to the leading/trailing edge reinforcements.

Each cell must be checked.

### **Visual Control of the Risers and Lines**

Check the risers, the trimmers, the stitching at each line loop, the brake lines, all seams and line contact points. Each line must be measured and inspected for kinks.

### **Strength test of the lines**

One complete A-and B- line must be removed, measured and submitted to a strength test. The measured value of each individual line must be noted in the inspection protocol. The minimum of the lines strength are 125% of the normative guidelines.

### **Measurement of the lines**

Measure every single line while stressing it with defined tractive force. Compare with the line plan. The results are recorded in the inspection protocol and are to be evaluated according to the internal guidelines of the workshop.

### **Assessment**

The measurements of all procedures are noted in the inspection protocol. When all facts have been recorded, the technician must make a general assessment.

Check the backpack for damage to the zips, seams and straps and repair if necessary with a sewing machine.

### **General Remarks**

Any other repairs, corrections etc. to the general condition of the paraglider must be evaluated. A copy of the results of each inspection must be sent on to Fly & more Handels GmbH ICARO Paragliders.

If the glider is not in great condition, the technician can decide to shorten the inspection interval time from 24 to 12 months. The technician must report any unusual faults to Fly & more Handels GmbH ICARO Paragliders within 3 days.

### ***Inspection Reference***

Only an authorised technician who has been trained by Fly & more Handels GmbH ICARO Paragliders is authorised to sign and date the glider certification label and sign the manual.

## VI. Terms of the guarantee

---

The Fly & more Handels GmbH ICARO Paragliders guarantees the proper processing, an operation within the allowable limits of proper operation and the fulfillment of the eligibility criteria of glider / harness / rescue equipment at the time of first delivery by the Fly & more Handels GmbH ICARO Paragliders.

### ***What is covered by the guarantee?***

Provided that Fly & more GmbH accept the fault the guarantee contains all necessary spare parts related to the replacement or repair of defective parts and working time.

### ***How long is the guarantee?***

Paragliders: Fly & more Handels GmbH ICARO Paragliders warrants a guarantee about

- 150 flight hours, maximum for a period of two years for the Lightweight paraglider **OXYGEN**, the **GTO** and the **NIKITA** and
- 300 flight hours on all other licensed paragliders, maximum for a period of three years  
calculated from the date of delivery by Fly & more Handels GmbH.

Harnesses: 3 years calculated from the day when the harness was delivered through Fly & more Handels GmbH.

Rescue system: 3 years calculated from the day when the rescue system was delivered through Fly & more Handels GmbH.

### ***What are the conditions of the guarantee?***

- Fly & Handels GmbH needs to be informed immediately after the discovery of a defect and the defective product must be sent to us for testing.
- The glider / the harness was used in normal circumstances and maintained according to the instructions. This includes in particular the careful drying, cleaning and storage.
- The glider / the harness was used only within the applicable guidelines and all rules have been complied with all times.
- All flights must be accounted for within the flight book.
- There were only original spare parts used and checks, exchange and / or repairs were conducted by an authorized dealer or by Fly & more Handels GmbH ICARO Paragliders company / person and properly documented.
- A fully and correctly completed guarantee card must be sent at least 6 weeks after buying the glider to Fly & more GmbH commercial. Alternatively can this be sent via the appropriate online form on [www.icaro-wings.de](http://www.icaro-wings.de).
- Fly & more Handels GmbH ICARO Paragliders does not accept any responsibility or replacement of the above obligation. However, there is the possibility that there will be a sign of goodwill.

### ***What is excluded from this guarantee?***

- Gliders and Harnesses that are used for training purposes, Acro or other official competitions,
- Gliders / Harnesses who were involved in an accident,
- Rescue equipment, which has been thrown for a emergency,
- Gliders / harnesses and rescue equipment, which have been changed by yourself,
- Gliders / harnesses and rescue equipment that were not purchased from an authorized dealer / flight school,
- Gliders / harnesses and rescue equipment where the required inspection intervals were not met and the verification of the glider was not conducted by a Fly & more Handels GmbH ICARO Paragliders authorized operation / person
- Damage which has occurred due to improper treatment (i.e. storage in humidity, heat or direct sunlight)
- Parts that need to be replaced due to normal wear and tear,
- Discoloration of the cloth material used,
- Damage caused by solvents, salt water, insects, sun, sand, humidity or “debag-jumps”.
- Damage caused by force majeure.

### ***How can I claim guarantee?***

In order to claim a guarantee Fly & Handels GmbH ICARO Paragliders needs to be informed immediately after the discovery of a defect and the defective product returned for inspection. Fly & more Handels GmbH ICARO Paragliders accept no freight costs (outbound and return transportation).

## **VII. Enviromental aspects**

---

The materials of which a paraglider is made require a special waste disposal. So please send disused gliders back to us. We will care about a professional waste disposal without costing for you.

## **VIII. Attitude and behaviour towards nature**

---

Actually it´s self-evident, but nevertheless we would like to mention particularly:

- Please do our nature-near sport in a way which doesn´t stress nature and environment!
- Please don´t walk beside the marked ways, don´t leave your litter, don´t make unnecessary loud noises and respect the sensitive balance in the mountains.
- Especially at the take-off we have to take care for the nature!

**\*\*Especially at the launch site consideration is needed! \*\***

## IX. Last but not Least

---

Again, we would like to congratulate you on the purchase of your **TWICE!**

Team ICARO thank you for your trust in our brand and should you have any questions, ideas or criticisms, please contact us. This paraglider has been developed and produced by modern technology and will give you years of pleasurable and unforgettable flight experiences.

This paraglider will not protect you from the dangers of rash flight manoeuvres and weather changes.

### Your ICARO-Team



**Fly & more Handels GmbH ICARO Paragliders**  
**Hochriesstraße 1, 83126 Flintsbach, Germany**  
Telefon: +49-(0) 8034-909 700 Fax: +49-(0) 8034-909 701  
E-mail: [office@fly-more.com](mailto:office@fly-more.com) Web: <http://www.icaro-wings.de>

**Appendix: Guarantee card, Certification, Airborne Sports  
Equipment, Lineplan**

**GUARANTEE CARD**

Owner of glider/ harness/ rescue system

Name	
Adress	
Zip Code	City/ country
Phone / Fax / e- mail	
Common flying site	Flight experience

Main field of usage of the glider/ harness (please mark)			
Leisure	Competition	Training	Professional
Acro	Powered	commercially	

Dats above glider/ harness/ rescue system		
Type und size of glider/ harness/ rescue system	Purchasing date	Serial number

Dealer/Icaro agency: (Name and address or stamp)

Furthermore, I would like to inform Fly & more Handels GmbH ICARO Paragliders as follows:

-----  
Date

-----  
Signature

All personal data will be treated in strict confidence and not passed on to third parties without the consent

Deutscher Hängegleiterverband e. V. im DAeC  
DHV/OeAeC-Technikreferat

LBA-anerkannte Prüfstelle für Hängegleiter und Gleitsegel



# MUSTERPRÜFBESCHEINIGUNG

**Gleitschirm**

Musterprüfnummer **DHV GS-01-1586-07**

Bezeichnung des Gerätemusters

**Icaro Twice**

Das nachstehend bezeichnete Luftsportgerät ist als Muster geprüft im Auftrag von:

**Fly & more GmbH, ICARO, Hochriesstraße 1, 83126 Flintsbach, Deutschland**

Diese Musterprüfbescheinigung ist erteilt auf Grund der die Musterprüfung betreffenden Bestimmungen des Luftverkehrsgesetzes, der Luftverkehrs-Zulassungs-Ordnung, der Verordnung zur Prüfung von Luftfahrtgerät und der Lufttüchtigkeitsforderungen in der heute geltenden Fassung sowie zu den Bedingungen der Vereinbarung über Musterprüfung und des Schreibens vom 03.01.2007.

Die Musterprüfung gilt gemäß zugehörigem Geräte-Kennblatt Nr.: **DHV GS-01-1586-07**

03.01.2007

Datum der Ausstellung

Unterschrift



**Deutscher Hängegleiterverband e.V. im DAeC**  
**DHV/OeAeC-Technikreferat**  
 LBA-anerkannte Prüfstelle für Hängegleiter und Gleitsegel  
 Beauftragter der österreichischen Luftfahrtbehörde

## Luftsportgeräte-Kennblatt Gleitschirm

Geräte-Kennblatt Nr.: *DHV GS-01-1586-07* Ausgabe:0 Datum: *03.01.2007*

### I. Musterprüfung

1. Gerätemuster: *Icaro Twice*
2. Hersteller: *Fly & more GmbH, ICARO*
3. Datum der Musterprüfbescheinigung: *03.01.2007*

### II. Merkmale und Betriebsgrenzen

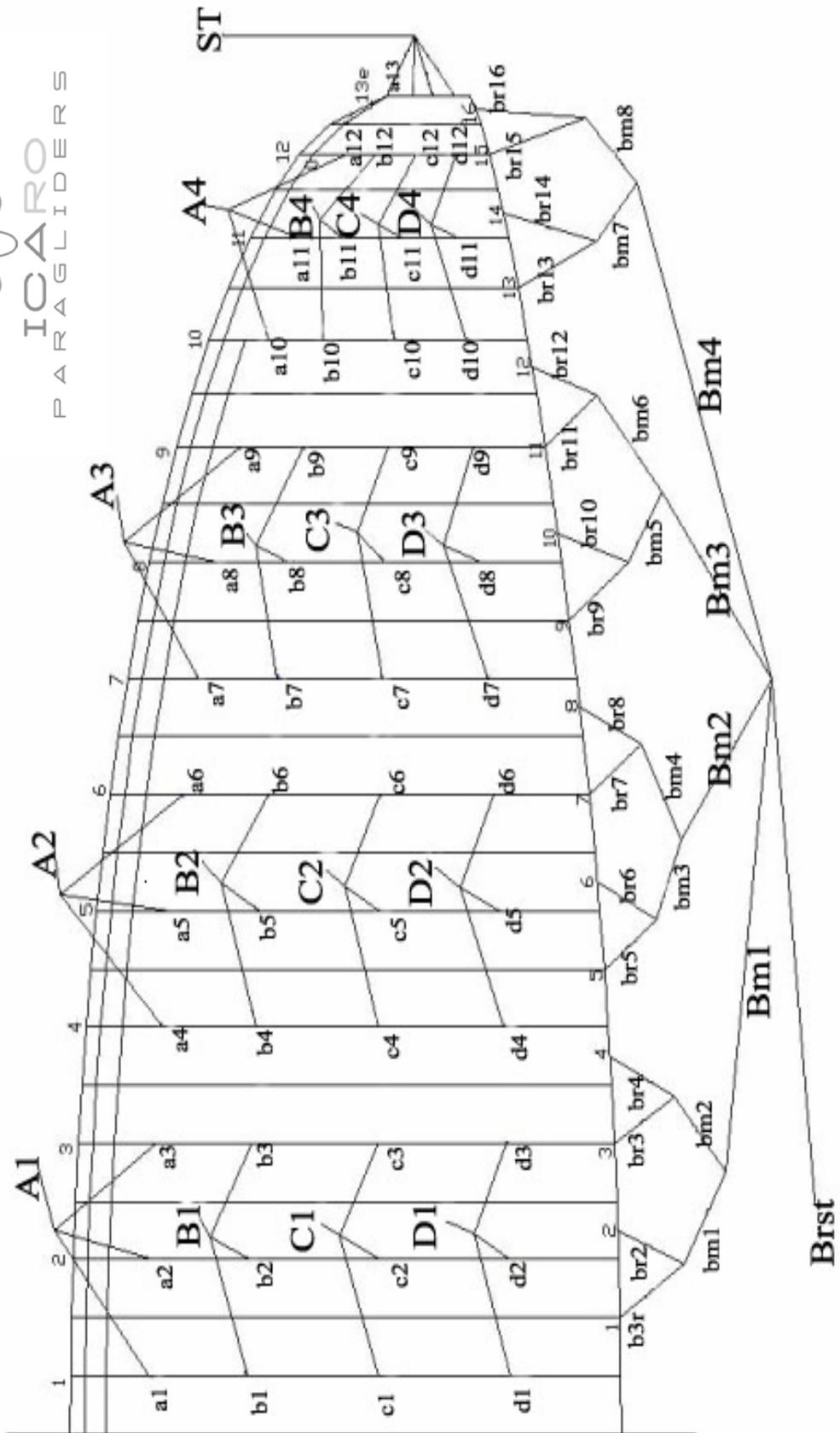
1. Gerätegewicht (ohne Packsack kg): *9.3*
2. Zulässiges Startgewicht minimal (kg): *140* maximal (kg): *225*
3. Anzahl der Sitze: min: *2* max: *2*
4. Klasse: *1-2*
5. Gurtzeugbeschränkung: *Biplace*
6. Fußbeschleuniger: *Nein*
7. Trimmer (von Hand zu bedienen): *Ja*
8. Projizierte Fläche (m<sup>2</sup>): *33.08*
9. Windschlepp: *Ja*
10. Tragegurtlängen (mm):

	Tragegurt A:	Tragegurt A2:	Tragegurt B:	Tragegurt C:	Tragegurt D:
normal:	455	455	455	440	415
beschleunigt:	455	455	455	460	460



ICARO  
PARAGLIDERS

**LINE-PLAN TWICE**



## Dispatch protocol/ Delivery content

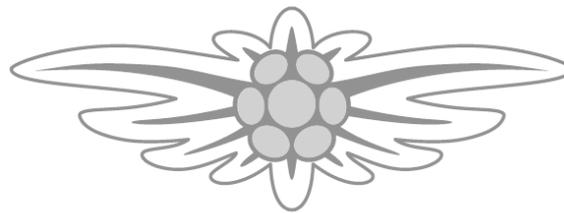
Piece check complete  
Inner bag  
Compression band  
Tandem spreader  
Outer rucksack  
Operating instructions  
Customer questionnaire  
Repair set  
T- Shirt  
Sticker

.....

Date

.....

Signature



ICARO  
PARAGLIDERS