


*Performance  
Designs*



*OWNER'S MANUAL*

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## **Spire owner's manual**

Thank you for taking the time to read this manual before using the Spire.

You are about to participate in a sport that originated in recent years. It combines many aspects of skydiving and paragliding, and for that reason many of the terms presented here derive from both sports. Regardless of your background, we ask you to consider the explanations in this manual carefully in the context of your understanding of skydiving and/or paragliding.

All definitions were accurate at the time of writing this manual. We do recognize, however, that some of the names and concepts described here will evolve as the sport matures.

### **Dear customer,**

We would like to thank you for the purchase of your new Performance Designs wing. We are confident that you will be pleased with it in every way. We hope you will enjoy countless exciting and fun experiences, and progress in your speedflying, speedriding and/or ground launching endeavors. This manual contains information on flying and maintaining your wing.

We urge you to familiarize yourself with this manual and also to inspect your new wing to completely familiarize yourself with its features and quality workmanship. Should you find anything that does not seem right, please contact your dealer or Performance Designs Inc. immediately.

Again, thank you for choosing a Performance Designs wing. Have fun!

Sincerely,

Performance Designs, Inc.

*William Coe*  
President

### **Safety First:**

By the purchase of this equipment, you accept all risks associated with speedflying, speedriding and/or ground launching activities, including injury or death. Improper use or misuse of Performance Designs equipment greatly increases these risks. Neither Performance Designs Inc. nor the seller of Performance Designs equipment will be held liable for personal or third party injuries or damages under any circumstances. The user is fully and solely responsible for the safe use of this equipment. If there is any doubt regarding the use or safety of this equipment, then it should not be used.

**Warning:** Speedflying, speedriding and/or ground launching are potentially dangerous activities. It is the user's responsibility to assess all weather and meteorological conditions, the flying area, the snow and surface conditions, all equipment, off-trail safety conditions, etc before you use this equipment. Speedflying, speedriding and/or ground launching wings should be used only while skiing or direct foot launching. This equipment was not designed for any other use.

This equipment should be launched from the ground and must never be used for jumping from any aircraft or high object (building, antenna, bridge, cliff, etc). You should wear a helmet as well as all safety equipment required for the practice of off-trail skiing or paragliding. It is strongly recommended to learn speedflying, speedriding and/or ground launching from a qualified school or instructor. When speedflying, speedriding and/or ground launching, always choose a safe, open area that enables you to keep a wide safety margin. The use of this wing normally requires special permission to be practiced on ski slopes and/or at designated paragliding launch locations. Always contact the local authorities or safety office before engaging in speedflying, speedriding and/or ground launching activities at such locations. Do not practice speedflying, speedriding and/or ground launching in the vicinity of ski lifts, cliffs, rocks or any other hazards.

### **Summary**

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## 1. Sport definitions

There are three distinct launching and flying methods when using the Spire. These are known as speedriding, speedflying, and ground launching.

*Speedriding:* This method consists of flying the wing on a pair of skis or a snowboard and spending most of the trajectory in contact with the ground.

*Speedflying:* This method consists of flying the wing on a pair of skis or a snowboard, but spending most of the trajectory in the air, making as little contact as possible with the ground.

*Ground Launching:* This method involves taking off on foot without skis or snowboard. Contact with the ground is limited to take off and landing.

For the purpose of readability, we will use the term “speedflying” from here on to describe all three of the above methods.

## 2. Performance Designs wings

Performance Designs, Inc. is a world-class ram air canopy manufacturer designing wings of excellence, providing the highest quality product through pride and integrity, and ensuring product reliability to exceed customers’ needs. Improving the performance of ram air canopies has been Performance Designs’ primary focus since Bill Coe founded the company in 1982. The company’s pool of talent quickly expanded in 1984 when Coe enlisted John LeBlanc, whom he met while studying aeronautics at Embry-Riddle Aeronautical University. Working together, Coe and LeBlanc have introduced cutting edge concepts and materials to the industry and have helped revolutionize ram air canopy design. Continually setting new standards in performance, quality, and customer support, PD has produced some of the most successful skydiving ram air canopies built to date.

Although Performance Designs’ main focus has been the development of skydiving canopies, moving into speedflying was a natural step. Many of the engineering concepts applied to high performance crossed-braced skydiving canopies are also valid for speedflying wings. It did not hurt either that the Velocity was already being used in speedflying events everywhere!

### **3. Presenting the Spire**

The Spire is a speedflying wing designed by dedicated engineers at Performance Designs. The Spire's heritage comes from the skydiving world, and this shows in its fast and steep glide ratio. Here are a few **STRONG** recommendations for using your Spire:

- Receive proper training
- Fly the wing at a wing loading no greater than 1.5 to 1
- Familiarize yourself with the terrain on which you intend to fly
- Always be prepared to land hillside and over uneven terrain. In the event that you have to land your wing hillside, continue to actively pilot your wing – keep your wing as close into the wind as possible. Note that most hillside landings will force the pilot to land with crossed wind. Continue to fly even if you are sliding across the hill, as this will continue to reduce your speed and reduce the risk of injury.

The Spire offers outstanding security for the practice of speedflying and great maneuverability. This allows the pilot to feel confident while developing the active and dynamic piloting skills needed to get the most out of this sport. Rapid progression is possible, as the pilot becomes acquainted with the many ways in which airflows can affect the wing.

#### **Who should fly the Spire?**

The Spire is an outstanding wing for experienced pilots in both the paragliding and skydiving communities who have had regular practice and are looking for a fast high performance wing. The Spire was modeled after a very high performance skydiving parachute, so it is intended for very experienced pilots. Even highly experience paraglider pilots may not be ready to fly the Spire without some instruction on the differences between the Spire and other speedflying wings.

#### **Cutting-edge design**

While creating the Spire, Performance Designs made an emphasis on developing a wing that provides security, even during what is known in the paragliding world as “passive piloting.” Passive piloting means not making corrections with the toggles to compensate for internal pressure variations, which often lead to collapses. The Spire's design also offers excellent take-offs and safe landings. Designed around the highest performance skydiving wing – the Velocity – the Spire has extremely similar characteristics including aspect ratio, cross-bracing, low overall profile, and control inputs. To take full advantage of the Spire's design, keep it flying fast and smoothly.

## **Manufacturing**

All Performance Designs wings are produced in the company's own facilities, applying the highest quality standards. Each step of the manufacturing process is handled with extreme care. A stringent quality control is made at each step. For example, we inspect 100% of all fabric used to build our wings.

## **4. Before you fly**

### **Pre-delivery Inspection**

Your instructor or dealer should have performed a test inflation followed by a test flight before delivery. Please confirm this has been done before flying the wing.

### **Risers and trims**

We built the Spire to be flown like a high performance parachute, where pulling directly on the rear risers reduces the airspeed and flattens the glide path. In contrast to other wings on the market, the Spire's fixed trim is very responsive and has a high descent rate. Seek the advice of your speedflying instructor to better understand the technique of flying with the rear risers.

### **Brake line adjustment and your harness**

The main brake line lengths of the Spire have been fine tuned by Performance Designs test pilots, and it should not be necessary to adjust them.

If you do need to make adjustments to suit your harness, body, and flying style, we strongly recommend that you test fly the wing with minute adjustments at a time.

The Spire can be flown with a variety of harnesses. Please consult your dealer or instructor to determine which one is right for you. Keep in mind that different harnesses have varying riser attachment positions. Any change in the position of the riser attachments may have a direct effect on brake line length, which could impair you from properly maneuvering the Spire.

### **In order to fly with this equipment, you should:**

- Have received theoretical and practical instruction for speedflying.
- Have sufficient practice, knowledge, and experience to correctly use this wing.
- Have subscribed to the licenses and insurance policies necessary for the practice of this sport.
- Be in normal physical and mental health and not be under the influence of any substance.



- Fly only in meteorological conditions that are fit for the practice of speedflying, and match your experience level.
- Wear a helmet and all safety equipment necessary to the practice of off-trail skiing, speedflying, speedriding and/or ground launching (i.e. elbow pads, knee pads, back pads, etc.)
- Have thoroughly checked all your equipment.
- Be aware of all the information contained in this manual.

## **5. Flying the Spire**

The Spire is in essence a high performance wing; therefore, only qualified and highly skilled pilots should attempt to fly it. We recommend that you first practice inflating your wing on a small training slope. Make your first flights with your new Spire in gentle conditions in a familiar area. We also recommend kiting the wing as often as possible. This will allow you to become familiar with the control inputs in a safe environment and also to visually inspect the wing and line attachments to ensure that your wing is properly assembled. Do not kite in winds exceeding 20 mph (31 km/h).

Speedriding, as described earlier in this manual, involves using skis or a snowboard to gain the speed needed to first launch your Spire, then staying on or close to the ground. Typically, speedriders like to use the smaller sizes (8m, 9m, or 10m), depending on experience and conditions, in order to stay on the ski slope or just above it at all times. For Speedriders, we recommend that you first practice inflating your wing on a small training slope with skis and make your first flights with your new speedriding wing in gentle conditions in a familiar area.

In speedflying, on the other hand, the goal is to stay airborne through the duration of the flight. Typically, Speedfliers will use Spires in the 10m, 11m, 12m, or larger sizes, depending on conditions and ability. For Speedfliers, we recommend that you first practice inflating and kiting your Spire on a small training hill and make your first flights in 5-10 mph (8-16 km/h) winds on an open slope free of obstacles.

### **Preparation for launch**

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, snow conditions, and ground conditions.
- Inspect your wing, harness, helmet and any other equipment.
- Choose a sufficiently large take-off area with even ground and no obstacles.
- Lay the wing open on the ground, and get the lines and risers sorted out.
- Put your helmet on. Secure yourself in your harness.

- Connect the risers to your harness carabineers or 3-ring system, ensuring there are no twists or loops around the lines.
- 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 zero or light winds.

### **Pre-flight check list**

- Helmet and harness buckles closed.
- Lines free.
- Wing open and laid into the wind.
- Airspace clear.

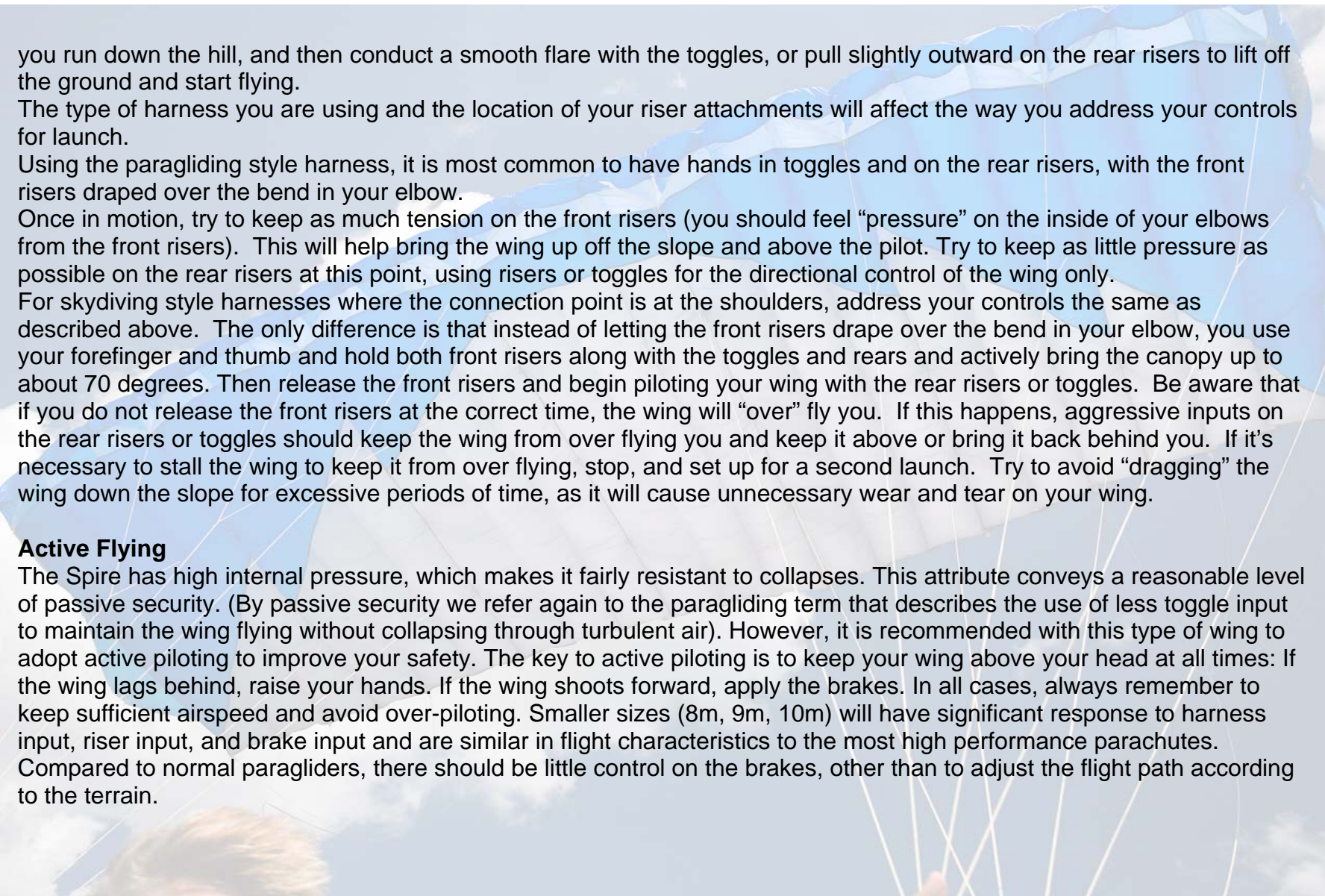
### **Take off**

The key to a successful launch technique is to practice ground handling, or kiting, whenever you can. We cannot emphasize enough the value of ground handling. This includes kiting in open areas in steady, but moderate, winds. Winds that are consistent, not gusting, and in the range of 7-17 mph (11-27 km/h) are great for practicing active kiting skills. Also, practicing your "no" wind to "light" wind handling skills is very important. In light winds, in an open area, you can practice laying your Spire, checking for line continuity, and also practice gear checks and no wind "drag ups." If you master the skills of dragging the Spire up over your head, in light to no wind, then you should have little to no trouble bringing the wing up over your head on skis.

If you keep your brake handles/toggles in your hands, the Spire inflates easily, with or without risers in hand. Keep your arms slightly bent and hands at shoulder height. If you are using the front risers, your arms should rise in a curve. It is not necessary to pull hard on the risers. If you are actively using the front risers, by holding them in your hand, during the drag up and inflation process, remember to release front riser input before the wing overtakes you. Usually, when the wing is about 60 to 70 degrees, it is the correct time to "release" the front risers. Now, it is time to begin to actively pilot the wing to full pressurization, using rear riser input or toggles. Remember the goal is to get and keep the wing directly above the pilot.

Do a visual check on your wing before taking off to see that it is correctly inflated and that there are no knots or tangles. If something is wrong, stop the take off. If you are ski launching, a slight pressure on the brakes and the speed developed by your skis always make the take off easier. If you are foot launching, wait until you feel the wing pulling ahead of you as





you run down the hill, and then conduct a smooth flare with the toggles, or pull slightly outward on the rear risers to lift off the ground and start flying.

The type of harness you are using and the location of your riser attachments will affect the way you address your controls for launch.

Using the paragliding style harness, it is most common to have hands in toggles and on the rear risers, with the front risers draped over the bend in your elbow.

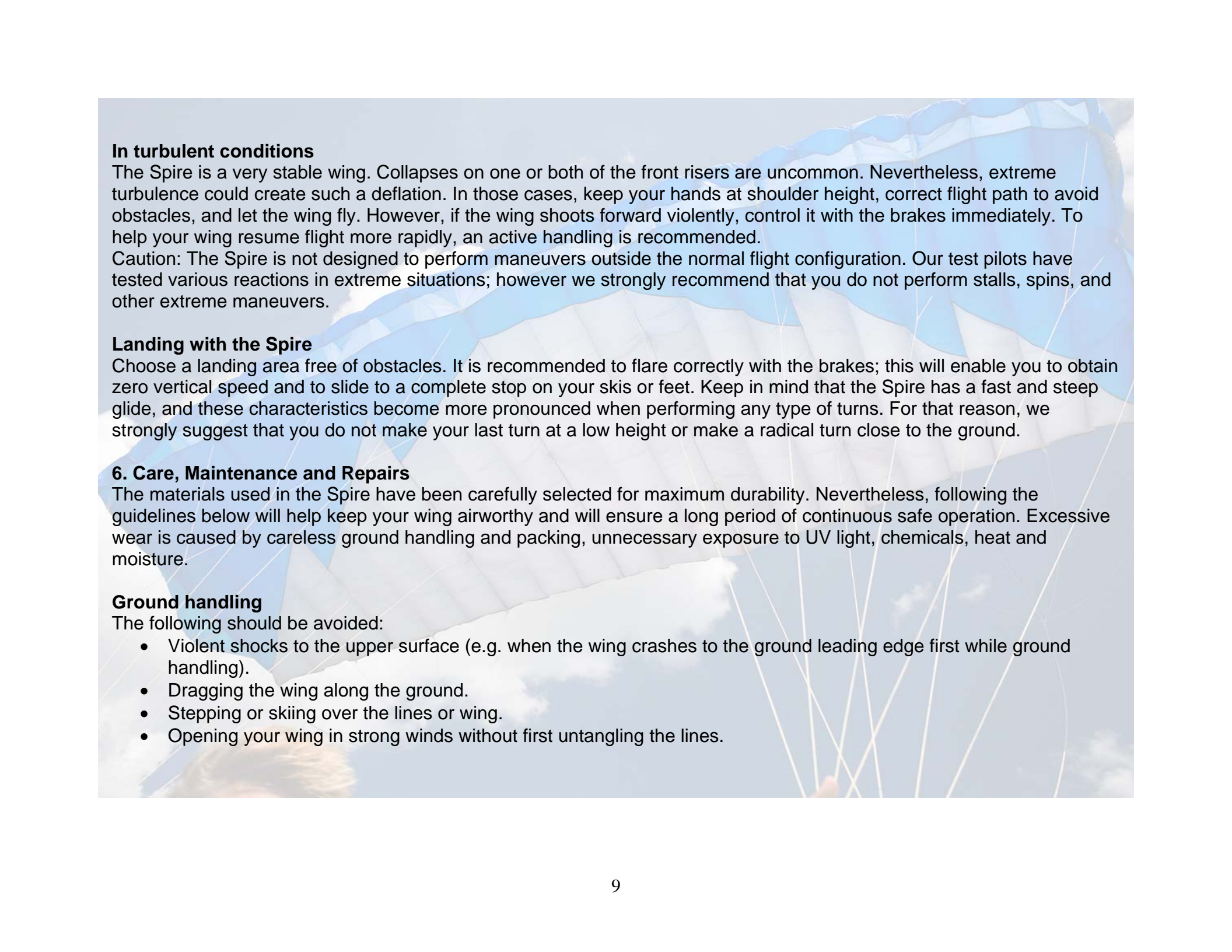
Once in motion, try to keep as much tension on the front risers (you should feel “pressure” on the inside of your elbows from the front risers). This will help bring the wing up off the slope and above the pilot. Try to keep as little pressure as possible on the rear risers at this point, using risers or toggles for the directional control of the wing only.

For skydiving style harnesses where the connection point is at the shoulders, address your controls the same as described above. The only difference is that instead of letting the front risers drape over the bend in your elbow, you use your forefinger and thumb and hold both front risers along with the toggles and rears and actively bring the canopy up to about 70 degrees. Then release the front risers and begin piloting your wing with the rear risers or toggles. Be aware that if you do not release the front risers at the correct time, the wing will “over” fly you. If this happens, aggressive inputs on the rear risers or toggles should keep the wing from over flying you and keep it above or bring it back behind you. If it’s necessary to stall the wing to keep it from over flying, stop, and set up for a second launch. Try to avoid “dragging” the wing down the slope for excessive periods of time, as it will cause unnecessary wear and tear on your wing.

### **Active Flying**

The Spire has high internal pressure, which makes it fairly resistant to collapses. This attribute conveys a reasonable level of passive security. (By passive security we refer again to the paragliding term that describes the use of less toggle input to maintain the wing flying without collapsing through turbulent air). However, it is recommended with this type of wing to adopt active piloting to improve your safety. The key to active piloting is to keep your wing above your head at all times: If the wing lags behind, raise your hands. If the wing shoots forward, apply the brakes. In all cases, always remember to keep sufficient airspeed and avoid over-piloting. Smaller sizes (8m, 9m, 10m) will have significant response to harness input, riser input, and brake input and are similar in flight characteristics to the most high performance parachutes.

Compared to normal paragliders, there should be little control on the brakes, other than to adjust the flight path according to the terrain.



### **In turbulent conditions**

The Spire is a very stable wing. Collapses on one or both of the front risers are uncommon. Nevertheless, extreme turbulence could create such a deflation. In those cases, keep your hands at shoulder height, correct flight path to avoid obstacles, and let the wing fly. However, if the wing shoots forward violently, control it with the brakes immediately. To help your wing resume flight more rapidly, an active handling is recommended.

Caution: The Spire is not designed to perform maneuvers outside the normal flight configuration. Our test pilots have tested various reactions in extreme situations; however we strongly recommend that you do not perform stalls, spins, and other extreme maneuvers.

### **Landing with the Spire**

Choose a landing area free of obstacles. It is recommended to flare correctly with the brakes; this will enable you to obtain zero vertical speed and to slide to a complete stop on your skis or feet. Keep in mind that the Spire has a fast and steep glide, and these characteristics become more pronounced when performing any type of turns. For that reason, we strongly suggest that you do not make your last turn at a low height or make a radical turn close to the ground.

### **6. Care, Maintenance and Repairs**

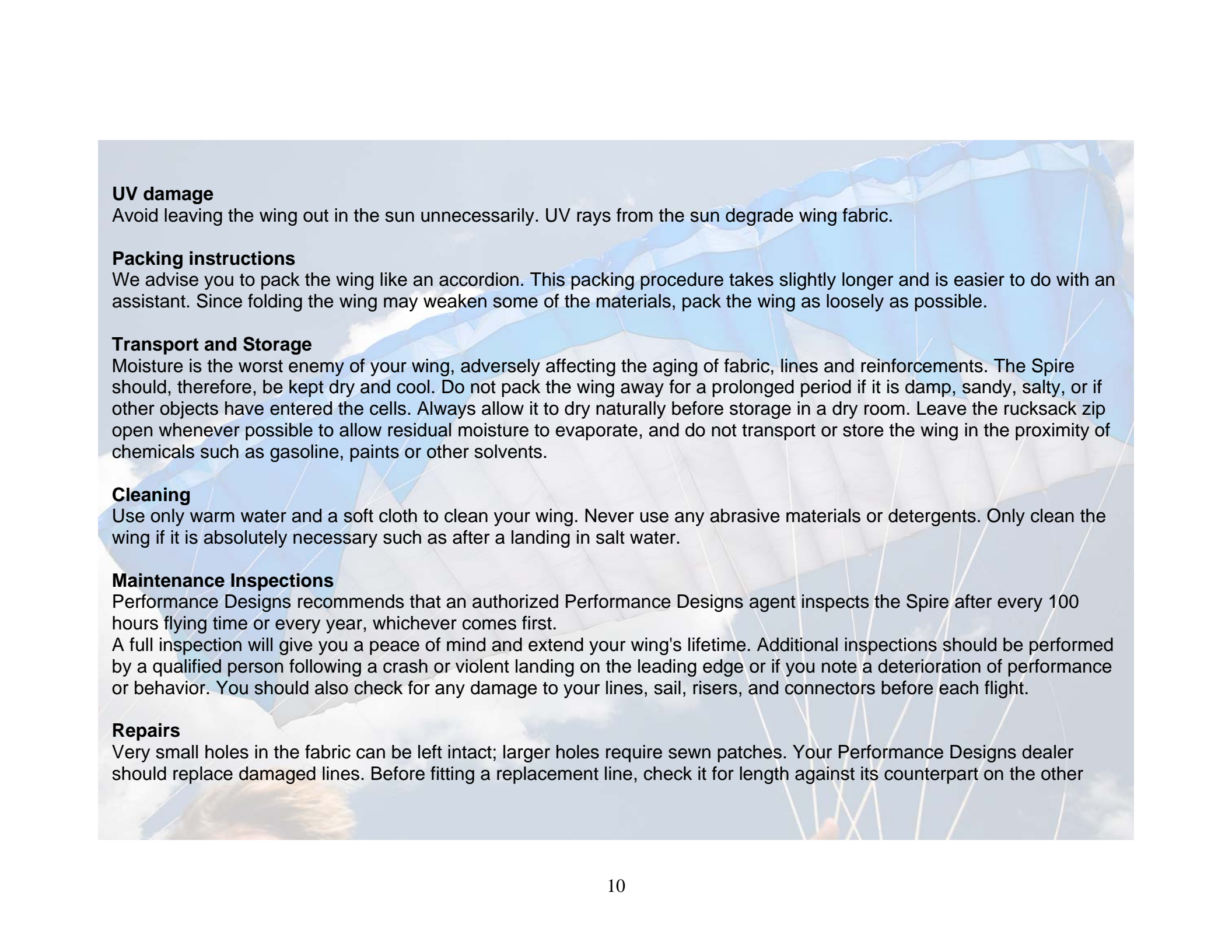
The materials used in the Spire have been carefully selected for maximum durability. Nevertheless, following the guidelines below will help keep your wing airworthy and will ensure a long period of continuous safe operation. Excessive wear is caused by careless ground handling and packing, unnecessary 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 wing crashes to the ground leading edge first while ground handling).
- Dragging the wing along the ground.
- Stepping or skiing over the lines or wing.
- Opening your wing in strong winds without first untangling the lines.





### **UV damage**

Avoid leaving the wing out in the sun unnecessarily. UV rays from the sun degrade wing fabric.

### **Packing instructions**

We advise you to pack the wing like an accordion. This packing procedure takes slightly longer and is easier to do with an assistant. Since folding the wing may weaken some of the materials, pack the wing as loosely as possible.

### **Transport and Storage**

Moisture is the worst enemy of your wing, adversely affecting the aging of fabric, lines and reinforcements. The Spire should, therefore, be kept dry and cool. Do not pack the wing away for a prolonged period if it is damp, sandy, salty, or if other objects have entered the cells. Always allow it to dry naturally before storage in a dry room. Leave the rucksack zip open whenever possible to allow residual moisture to evaporate, and do not transport or store the wing in the proximity of chemicals such as gasoline, paints or other solvents.

### **Cleaning**

Use only warm water and a soft cloth to clean your wing. Never use any abrasive materials or detergents. Only clean the wing if it is absolutely necessary such as after a landing in salt water.

### **Maintenance Inspections**

Performance Designs recommends that an authorized Performance Designs agent inspects the Spire after every 100 hours flying time or every year, whichever comes first.

A full inspection will give you a peace of mind and extend your wing'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 behavior. You should also check for any damage to your lines, sail, risers, and connectors before each flight.

### **Repairs**

Very small holes in the fabric can be left intact; larger holes require sewn patches. Your Performance Designs dealer should replace damaged lines. 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 wing on flat ground to check that everything is in order before flying. Major repairs, such as replacing panels, should only be carried out by the distributor or manufacturer.

## 7. Spire technical data

PD Spire wing load chart													
PRICE	SHIPPING WEIGHT	CANOPY MODEL	STUDENT (Lbs./KG.)	NOVICE (Lbs./KG.)	INT (Lbs./KG.)	ADV (Lbs./KG.)	EXP (Lbs./KG.)	MIN.	MAX.	SPAN (FT./Mtrs.)	CHORD (Root/Tip) (FT./Mtrs.)	ASPECT RATIO	AREA (FT.)
								(Lbs./KG.)	(Lbs./KG.)				
Call for Price	7 lbs	Spire-08M	N/R	N/R	N/R	103/47	150/68	86/39	174/79	15.22/4.64	5.69/1.73	2.6914:1	86.1
Call for Price	7 lbs	Spire-09M	N/R	N/R	N/R	117/53	171/78	96/44	198/90	16.1/4.9	6/1.83	2.6914:1	96
Call for Price	8 lbs	Spire-10M	N/R	N/R	N/R	125/57	182/83	108/49	211/96	17.02/5.19	6.36/1.94	2.6914:1	107.6
Call for Price	8 lbs	Spire-11M	N/R	N/R	N/R	134/61	196/89	118/54	227/103	17.85/5.44	6.67/2.03	2.6914:1	118.4
Call for Price	8 lbs	Spire-12M	N/R	N/R	N/R	156/71	228/103	129/59	264/120	18.64/5.68	6.96/2.11	2.6914:1	129.1

Every effort has been made to provide you with important and useful information in this flight manual. However, please remember that this is not an attempt to teach you how to fly and that courses in a certified professional school are necessary for the safe practice of speedflying. This flight manual may be amended at any time without any prior notice. Please visit our website [www.performancedesigns.com](http://www.performancedesigns.com) for all the latest information regarding the Spire and all other Performance Designs products.