



User manual

# Reserve Parachute

## START

Pull down APEX Rescue parachutes

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Thank you for choosing a SUPAIR reserve parachute! We are glad to be able to join you in a common passion : paragliding!

SUPAIR has been designing, manufacturing and distributing accessories world wide since 1982. Choosing a SUPAIR product is the right choice for anyone to make, for it is supported by thirty year of expertise and innovating designs driven by customer feedback always taken into account.

Next, are explicit instructions to familiarize yourself with the products technical features. Please, carefully read the following content!

Visiting our website at [www.supair.com](http://www.supair.com) , will also bring you the latest updates. Additionally, if in doubt, questions will be answered by contacting any of our network representatives. Naturally the entire SUPAIR Team will be at your disposal to quickly answer any additional question you may have by contacting it at [info@supair.com](mailto:info@supair.com)

We wish you the best of flights.

The SUPAIR team.

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After having read this manual, we will recommend you to conduct a reserve parachute extraction under a hang-test device before your first flight.

N.B. : The following three icons will help you to understand this manual



Advice



Caution !



Danger !!

## SUP'AIR'S RESERVE PARACHUTE START.

The reserve parachute "START" was designed by the SUP'AIR in-house Research and Development team.

Mainly, this model wants to be seen as a quality product with an attractive price.

We are using known products to guaranty quality and high performance.

A basic, easy to pack and very stable reserve parachute.

Certification	EN 12491 and LTF 35/03
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### ▼ Characteristics :

Sink rate below 5.5 m/s at maximum load ( tests and measurements conducted in a laboratory ).  
 Liros lines 10150-0450 (M and L) 00099-1628 ( Tandem).  
 Riser bridle : Length 28cm, Polyester bridle with 2500DaN.  
 Pull-down APEX type rescue parachutes with one color per hemisphere to facilitate visualization during repacking.  
 Manual gore cutting, computerized stitching of the main webbing.

### ▼ Options

-(120 g ) 145 mm "Y" risers. - Two stainless steel 6 mm square Maillons Rapides® ( for the connection harness reserve/parachute ) - ( 84 gr. for the set ) - Lark's head knot connection on the reserve parachute side.



START	Size M	Size L	Tandem
Tested minimum Total Hooking Weight.*	70 Kg	-	-
Maximum Total Hooking Weight.*	100 Kg	125 Kg	215Kg
Weight	1 750 g	2 150 g	3 650 g
Surface area	31,16 m <sup>2</sup>	38,94 m <sup>2</sup>	65,75 m <sup>2</sup>
Gore number	16	18	22

Total flying weight without the glider.

## EN 12491 norm

This notice shows the information requested by the EN 1291 norm. This European Norm (EN) is required for all the paragliding reserve parachutes. All our reserve parachutes are conforming to the EN norm.

The reserve parachute certification code EN 12491 is described as follows:

- Flight proper sequence : during a straight flight, the reserve parachute is deployed. In order to conduct accurately reproducible tests by avoiding any interference from the paraglider, the test-pilot releases his paraglider at peak height during a roll to begin the descent with an important instability factor.
- The maximum sink rate is measured during the last 30 meters, the paragliding wing is released, below or equal to 5,5 m/s under maximum load.
- Stability is checked in a subjective visual way ( with a rolling effect or not ), and is gauged against the overall sink rate ( an unstable reserve parachute usually demonstrates a higher sink rate).
- The reserve parachute opening speed must be inferior to 5 seconds.

- Structural tests ( resistance ): consists of verifying the overall structural integrity of the parachute under maximal load for a given horizontal 32 m/s speed. There can not be any failure / damage taking place on the riser / lines / canopy cascade during the entire procedure.

The certification results can be found at [www.supair.com](http://www.supair.com)

## Flight test

European Norm 12491

**200 m**

Opening speed + Wing jettisoning

**150 m**

STABILITY

**30 m**

Sink rate < 5,5 m/s at maximum load.



# STRUCTURAL TEST EUROPEAN Norm 12491





Guideline procedures to follow with our reserve parachutes :

To begin with, we must stress that using a reserve parachute should never be taken for granted or considered to be without risks to the pilot. A reserve parachute is only there to deploy in case of an emergency situation.

The pilot's weight must conform to the parachute manufacturer's recommended load limitations to be fully operational. Any intent to use a reserve parachute below or above the manufacturer's recommended weight limitations is dangerous and must totally be avoided.

- Any reserve parachute riser connection to the harness must result with the pilot landing on his legs and standing.

The parachute must be left unmodified to keep it aligned with the certification procedure it went through to assure a proper deployment sequence to take place.

- It is very important to learn how the parachute works, and only during a dedicated ( SIV - Simulated Flight Incident ) or equivalent course.

Deploying the Reserve Canopy :

- Find the deployment handle.
- Hold it firmly and pull it away from the outer container or harness.
- Using the deployment handle, jettison the inner pod forcefully into open air and AWAY from the paraglider. The reserve parachute pod will automatically open upon reaching maximum line and riser length under tension.

- Due to its central line design, the canopy will easily and quickly inflate.

- Once the reserve parachute is deployed, the pilot must disable the paraglider by symmetrically pulling as much as possible on the « B » risers to stabilize the descent.

NB : Our tandem reserve parachutes are delivered with the « Rose System » which automatically deflates and disable the paraglider while minimizing any possible interference with the parachute during the descent. This system is not available for solo reserve parachutes at this time.

- Upon landing, the pilot must be ready to cushion the impact by flexing his legs and roll sideways; exercising what is called a PLF landing ( Parachute Landing Fall ).

#### RECOMMENDATION AND CARE FOR THE PARACHUTE AFTER A WATER LANDING:

In case of a water landing, the parachute must be dried, followed by line stretching and reconditioning, following the manufacturer's guide lines.

Let the parachute dry outdoors in a shaded area, away from direct sunlight

Pre-stretch the lines with a 30 kg., and 50 kg. load for the Apex in order to limit Nylon shrinkage due to moisture and humidity. It is preferable to check the lines length with a 10 kg. load (see measurements chart on page 13).

- Proceed with the repacking procedure according to the manufacturer's guide line manual.

- Ensure a correct reserve parachute installation inside the harness by doing an extraction during a hang-test. Repeat installation procedure afterward.

To be noted:

An EN12491 certified reserve parachute must theoretically have a touch-down speed, equal or inferior to 5,5 m/s, which corresponds to a 1,80 meter jump. This impacting speed can greatly vary due to a few relevant factors: The air mass, the overall hooking weight, the paragliding wing configuration / design, and the density altitude. Two recent flight incidents with use of similar reserve parachute models ( X-Light ) during similar circumstances, demonstrated significant different results:

- One pilot touched-down with a 5,2 m/s sink rate with his paraglider disabled.

- The second pilot touched-down with a 9 m/s sink rate without a neutralized paragliding wing, or a free-fall jump from a 4 meter elevation

The paragliding wing's influence on the overall set-up ( paraglider / reserve parachute ) is important and not predictable nor quantifiable. The scenario can not be reproduced during the tests.



In spite of the positive statistics showing the obvious benefits of using a reserve parachute in case of an emergency, the later can not be taken for granted at any time or place.

To install the reserve parachute inside the harness or front mounted reserve parachute container, please refer to the harness or the front container owner's manual.

## A HANG-TEST AFTER INSTALLATION IS MANDATORY



After installing the reserve parachute in its container, it is mandatory to conduct a hang-test. Be certain for the handle to open all the container flaps prior the parachute extraction while evaluating the force amount exerted during the pull to jettison the rescue system. After a conclusive outcome, reinstall the reserve parachute by following the same procedure as before.

## Connecting the reserve parachute to the harness.

Two ways to install your parachute, depending on the riser type « Y » or separated.

### « Y » risers.

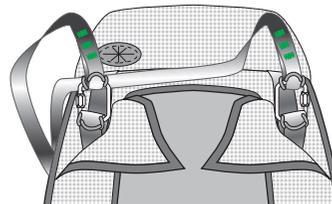
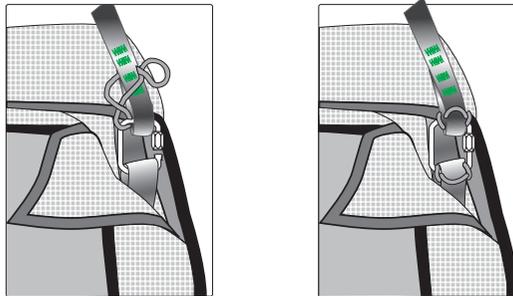
Use the Maillons to connect the risers to the harness. Our reserve parachutes are pre-equipped for this model.

1. Use a 7 mm Maillon Rapide® to connect the reserve parachute on the low end of the "Y" vertical stroke. Add the toric rings to lock the bridles onto the Maillon Rapide®.



2. Connect the riser split side to the harness's shoulder attachment points using the provided stainless steel (Inox) 6 or 7 mm.

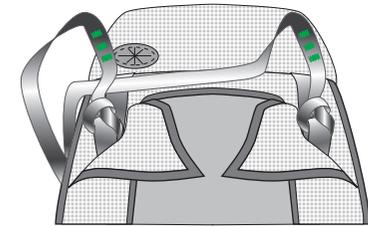
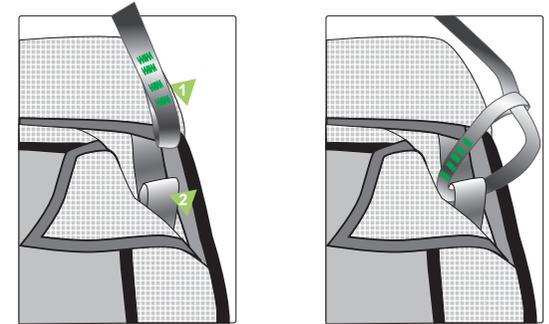
3. Use the toric elastic rings to secure the bridles to the maillons ou Maillons Rapides. Pas besoin de M majuscule si tu utilises maillons seul car ce n'est une référence à la marque Maillon Rapides®.



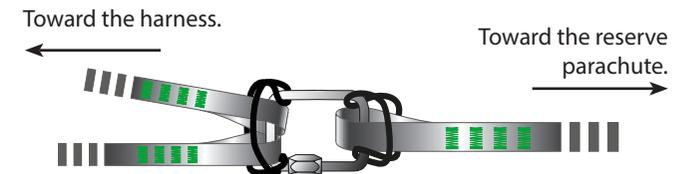
### Split risers.

Use a Maillon to fasten the reserve parachute to the risers.

1. 1 / Fasten the risers to the harness shoulder attachment points using a « loop to loop » connection (tighten well).



2. 2 / Connect the risers to the parachute with a rectangular 7 mm stainless steel (Inox) Maillon Rapide. Use the toric elastic ring to secure the bridles to the Maillons as indicated below.



## Installing the tandem reserve parachute.

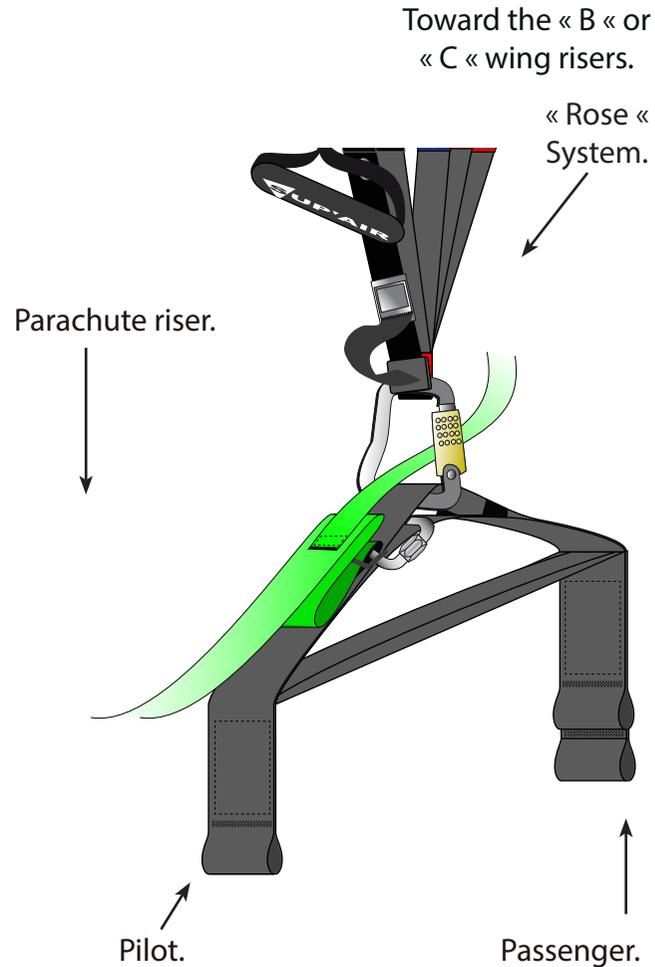
**1.** Connect the risers to the parachute using a rectangular 7 mm stainless steel ( Inox ) Maillon Rapide®, then use toric elastic rings to secure the bridles to the Maillons as indicated below.

Toward the reserve parachute.

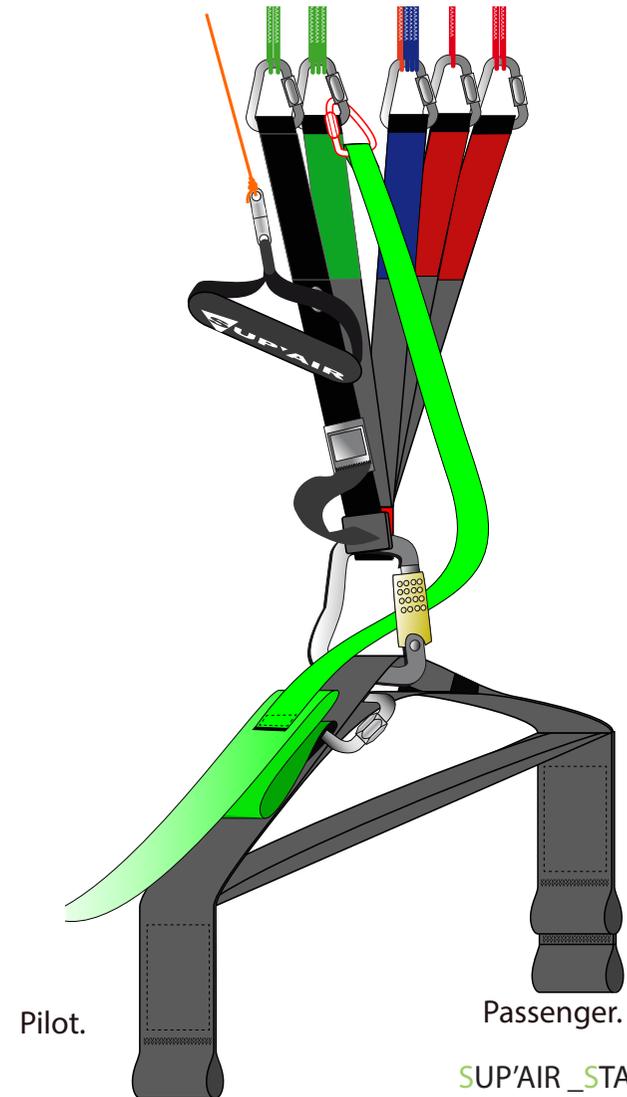


Toward the spreader-bars.

**2.** Connect the risers atop each spreader-bar ( main hooking location ), with the rectangular Inox ( stainless steel ) Maillon Rapide® + use toric elastic.



**3.** On both sides, push the small recoil « André Rose » strap / webbing, through the main paraglider carabiner riser, and connect it to the « B » or « C » paraglider riser using a triangular Maillon Rapide®. Maillon and riser denomination can vary from manufacturer to manufacturer.





Packing a reserve parachute is not very difficult but requires a methodical and precise folding procedure. If you feel uneasy about repacking the reserve parachute yourself, it will be

advisable for you to seek professional assistance to do the job correctly.

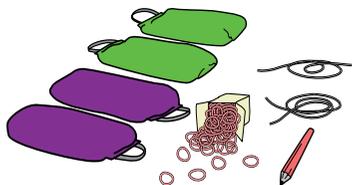
Tip: take advantage of having to repack your parachute, to deploy it on the ground and vent it for a while, prior proceeding to folding it again.

Before each repacking procedure, the following sequence must be observed :

- Carefully check each line from the canopy to the riser for any possible damage.
- Aerate the parachute for at least twelve ( 12 ) hours. Not in direct sunlight nor in a room filled with polluting chemical agents ( sprays ).
- Check the fabric for damage or soiling of any kind.
- Inspect the pod and parachute pocket for wear and tear to ensure a clean extraction using a properly fastened reserve parachute handle to the pod.
- Inspect the elasticated loop keeping the pod flaps securely closed.
- If you notice something unusual, send your parachute to be inspected by a professional specialized certified outfit.

**1.** Make a selective list of the following items needed to complete the repacking procedure :

- Elastics to keep the lines in place.
  - Sand ballasts weights or books.
  - A small thin piece of line about 30cm long.
- POD

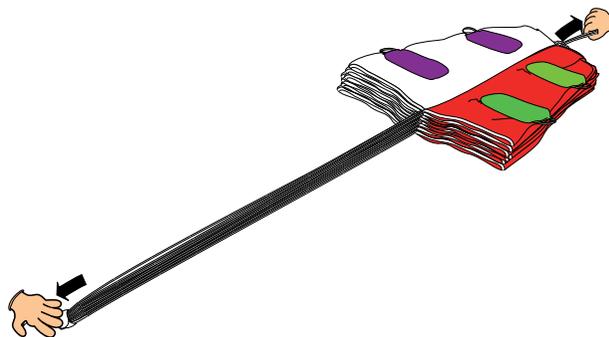


**2.** Keep the parachute unruffled with the lines running freely from the bridle «loop to loop» connection to the canopy's leading edge.

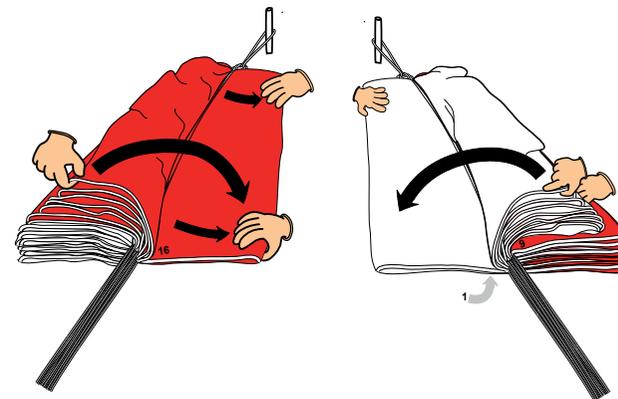
**3.** Tension all the lines from the riser. Push a string through the packing buckles located at the center of the panels stitching and balancing point between the lines and the central cord.



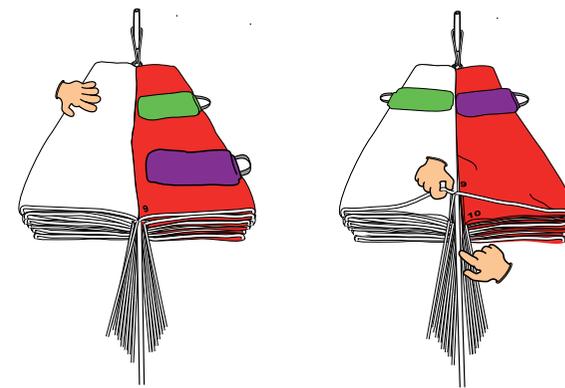
**4.** Control both lower and upper lines, ensuring that they run freely from the canopy to the riser(s).



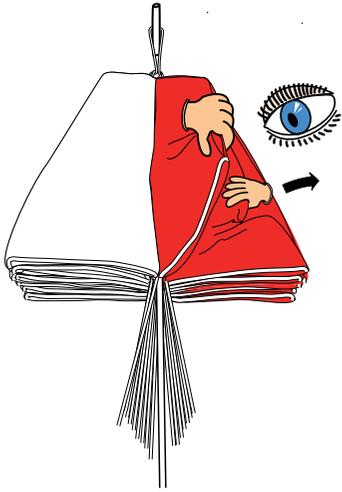
**5.** Successively overlap all the red panels to the right. Repeat the procedure with the white panels to the left, starting with panel number one ( 1 ).



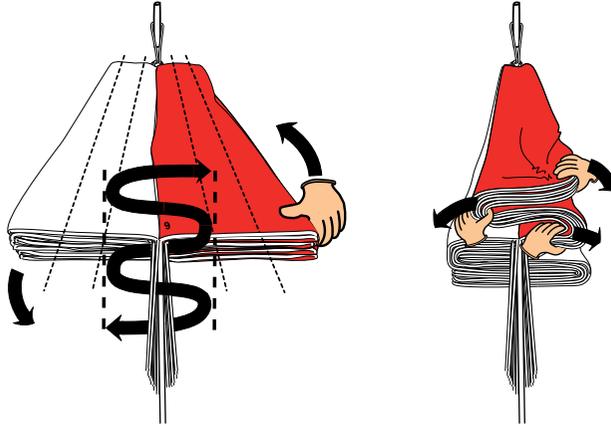
**6.** Be certain to have an equal panel ( gore ) count on each side ( the panel numbers may vary with other parachute models ). Be precise and verify that the bottom of the skirt ( leading edge ) is perfectly aligned and tidied..



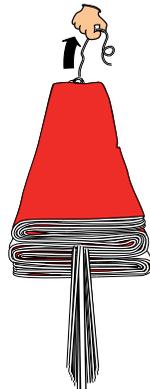
7. Lift the upper line to keep the folds tidied up along the entire panels length, and the wind channel unobstructed right up to the canopy's apex.



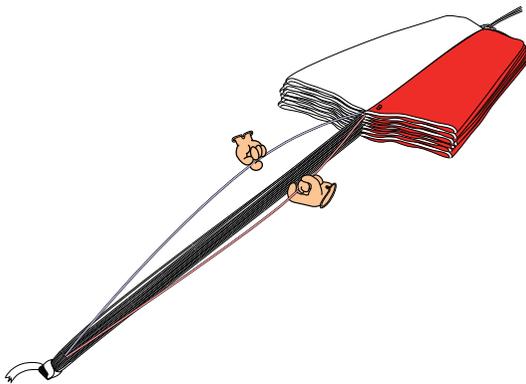
9. S-fold the left side of the canopy under the centre of the parachute, then S-fold the right side of the canopy onto the centre of the chute. Keep the canopy neatly folded in place using sandbags or books.



10. **WARNING!** Release the tension on the canopy and **IMMEDIATELY REMOVE THE TIE** holding the folding loops together. Not conforming to the described procedure would prevent the parachute from opening! ( See check list )..



8. Be certain for the upper and lower lines to freely run from the canopy to the risers.



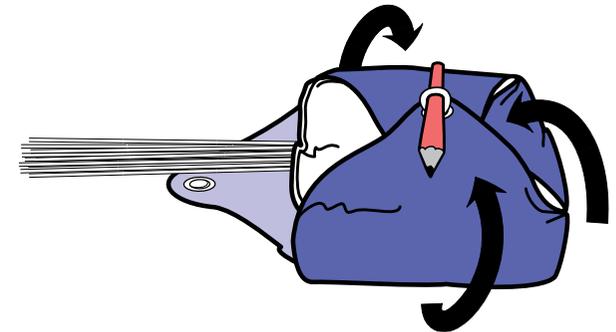
11. "S" fold the fabric.



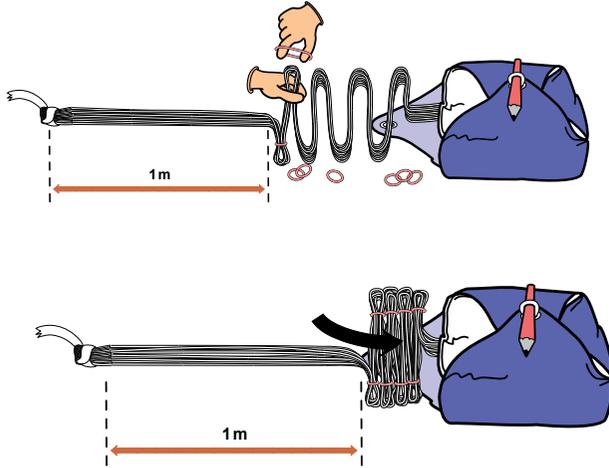
12. Place the pod at the top, then flip it all upside down with the "S" folded parachute. Keep a small space at the front of the parachute's leading edge to later fold and tuck away the lines.



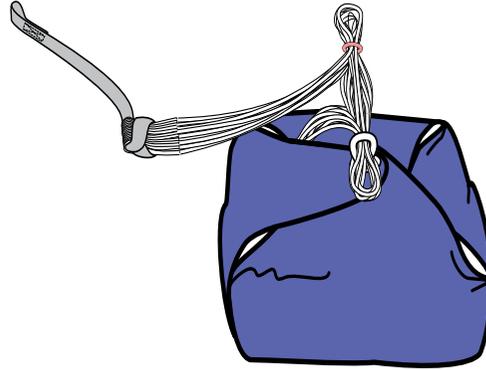
13. Close the container's rear flap and two lateral flaps.



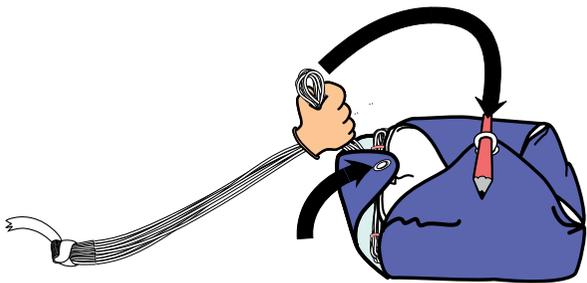
14. «S» fold the lines into the accommodating space left for them, leaving about 1m length of lines outside for the outer coils.



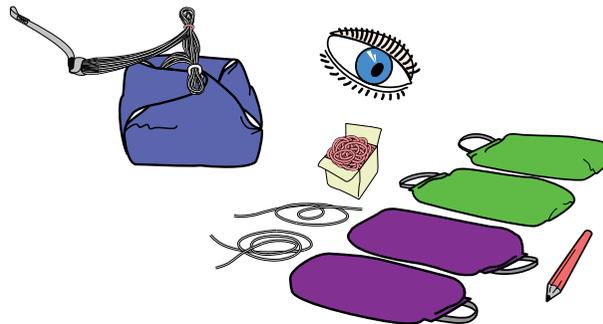
16. «S» fold the coil the remainder of the lines on the outside of the reserve parachute container.



15. Close the fourth flap and insert about 4 cm of folded lines through the elasticated loop to keep the container closed.



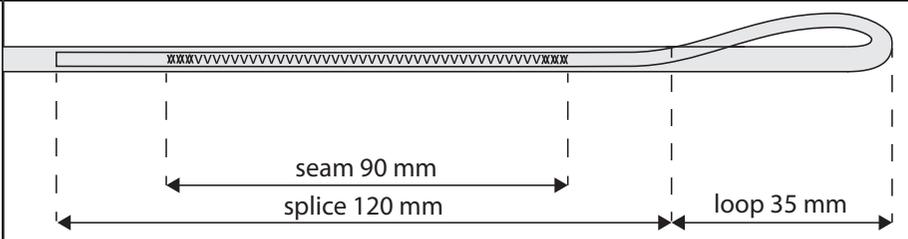
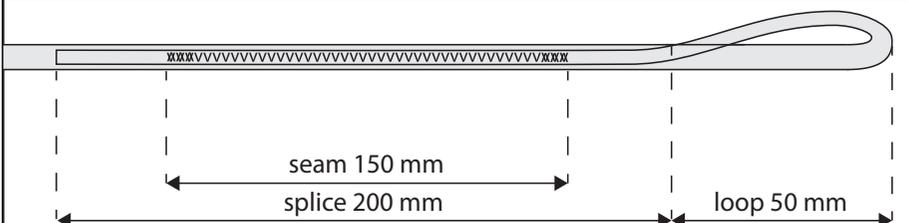
17. Verify that you have in your possession all of the listed items in step 1, as confirmation that none of them have been left inside the folded parachute.



NOTE : Videos pertaining to our reserve parachutes use and packing are available, and can be viewed at [www.supair.com](http://www.supair.com)

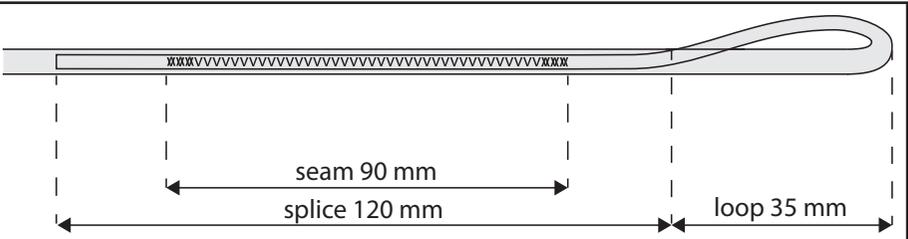
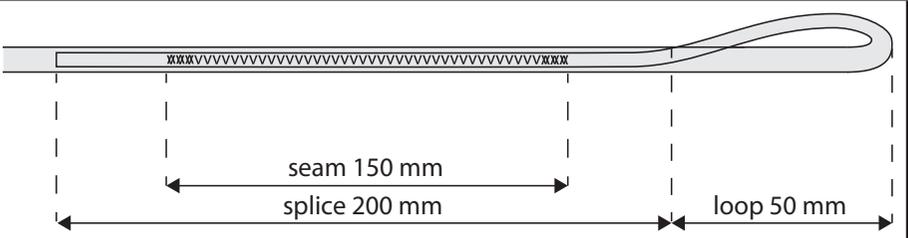
## START Size M reserve parachute line chart.

\* Measurements made under a 5 kg. tension.

Line	Cut	Sewn	Lines number	Line material	
Main lines	5110	4800	16	Liros 10150 - 0450	<p>2 times 155 mm extra length ( 35 mm buckle + 120 mm splicing - stitching length = 90 mm)</p>  <p>seam 90 mm splice 120 mm loop 35 mm</p>
Apex	6070	5570	2	Liros 10150 - 0450	<p>2 times 250 mm extra length ( 50 mm buckle + 200 mm splicing - stitching length = 150 mm)</p>  <p>seam 150 mm splice 200 mm loop 50 mm</p>

## START Size L reserve parachute line chart .

\* Measurements made under a 5 kg. tension.

Line	Cut	Sewn	Lines number	Line material	
Main lines	5810	5500	18	Liros 10150 - 0450	<p>2 times 155 mm extra length ( 35 mm buckle + 120 mm splicing - stitching length = 90 mm)</p>  <p>seam 90 mm splice 120 mm loop 35 mm</p>
Apex	6880	6380	2	Liros 10150 - 0450	<p>2 times 250 mm extra length ( 50 mm buckle + 200 mm splicing - stitching length = 150 mm)</p>  <p>seam 150 mm splice 200 mm loop 50 mm</p>

**START Tandem reserve parachute line chart .**

\* Measurements made under a 5 kg. tension.

Line	Cut	Sewn	Lines number	Line material		
Main lines	7330	7020	22	Liros 00099-1628	2 times 155 mm extra length ( 35 mm buckle + 120 mm splicing - stitching length = 90 mm)	<p>Diagram showing a line with a splice of 120 mm and a loop of 35 mm. The stitching length is 90 mm.</p>
Apex	8650	8150	2	Liros 00099-1628	2 times 250 mm extra length ( 50 mm buckle + 200 mm splicing - stitching length = 150 mm)	<p>Diagram showing a line with a splice of 200 mm and a loop of 50 mm. The stitching length is 150 mm.</p>

#### STORAGE :

When not in use, you must stow away your reserve parachute in a dry, cool, clean and UV rays free environment.

#### MAINTENANCE

5 If wet, you will have to immediately dry your parachute to avoid any bacteria / fungi buildup. Gasoline contact, or any other solvent / chemical agent, can considerably decrease and compromise your reserve parachute's structural integrity. In the case, the parachute will have to be controlled and checked by a professional specialized outfit. The outer container ( pod or also called diaper ), can be washed independently from the parachute, with water and mild soap, rinsed and dried. As for the parachute itself and its lines, use water only.

#### REPACKING FREQUENCY

In order to guarantee a quick opening speed and a sound structural integrity, your reserve parachute must be repacked every six months.

#### LONGEVITY

Your reserve parachute was designed to last maximum ten years if properly maintained as per manufacturer's recommendations. Pass that period, we will recommend you to have your parachute inspected at a professional certified outfit. The procedure should be implemented regularly throughout that ten year period.

#### RECYCLING

Our materials have been specifically selected for their exceptional resilience on the field and environmentally friendly abilities. None of the components used in the manufacturing of our reserve parachutes is environmentally harmful. The majority of our materials used is recyclable. We will ask you not to dispose of your old parachute with the regular trash but approach a specialized recycling facility instead. You can also bring it back to your SUPAIR dealer who will send it back to us .

#### WARRANTY

SUPAIR takes great care in its product design and manufacturing. SUPAIR guarantees its parachutes two years from the date of purchase against any defect or design flaw that would arise under normal use. Product mishandling, excessive exposure to aggressive factors (such as over heating, intense sunlight (UV), high humidity, aggressive chemical agents and such) that would become harmful and damaging to the merchandise, would void the warranty.

#### DISCLAIMER

Paragliding is an activity requiring attention, specific knowledge and sound judgment. Beware! Learn your skills under the supervision and guidance of certified approved structures. Contract a personal insurance, become a licensed pilot. Be humble when evaluating your proficiency level in respect to weather conditions before deciding on whether or not to fly. SUPAIR's liability coverage is for its product line only. SUPAIR can not be rendered responsible for your own actions. Fly at your own risk.

# MAINTENANCE & WARRANTY



Caution !

The SUPAIR reserve parachutes are exclusively designed and made for the free flying sports ( Paragliding, Powered-Paragliding, and Hang-Gliding ). Using this product in Skydiving, Base-Jumping and such activities, is totally prohibited.



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