Your last line of defence

General

The *ICARUS Reserve* complements the world renowned ICARUS main canopies like the SAFIRE 2, the CROSSFIRE 2, the OMEGA, the OMNI, the ICARUS Tandem, the EXTREME FX, the EXTREME VX offering a complete canopy solution for every modern skydiver and canopy pilot. Following its vision to design and develop the finest state-of-the-art wings, ICARUS Canopies is offering the *ICARUS Reserve* with the highest construction standards and impressive performance that will satisfy the high demands of today's skydivers. ICARUS Canopies has successfully completed the ETSO-C23d by EASA (European Aviation Safety Agency) and TSO-C23d (FAA) testing and certification process, complying with the latest and highest requirements for safety and performance in the industry.

Years of intensive field trial and use within rough military environments have proven the outstanding strength and reliability of the ***ICARUS Reserve*** in emergency situations where trust and effectiveness are required.

ICARUS Canopies has gone again *ONE STEP AHEAD* and has designed a state-of-the-art wing that provides fast, accurate and reliable openings as well as unique flight characteristics for a reserve canopy. From the safety and reliability of the opening, the jumper continues his/her flight under the ***ICARUS Reserve*** , with unparalleled flight and landing performance.

A bit of History

In 1999, ICARUS Canopies began the ***ICARUS Reserve*** project, in order to fulfill the market demand for a high quality Reserve canopy.

In May 2002, ***ICARUS Reserve*** certification testing began in France at the independent test center CEVAP (Centre d'Essais en Vol Aérotransport, Parachutage in Toulouse) - D.G.A. (Délégation Générale pour l'Armement) – Ministère de la Défense.

From July to September 2003, CEVAP successfully completed all the test drops according to ETSO-C23d certification requirements (refer to EASA regulations for further detail).

In November 2003, CEVAP issued the final test report, concluding with the satisfactory completion of all ETSO-C23d certification requirements, stating that “The reserve canopy PN 317523 (Part Number for the ***ICARUS Reserve***) has a good flight behavior, particularly during the landing phase”.

In October 2005, with the completion of the certification process, the EASA (European Aviation Safety Agency) issued the ETSO certificate for the ***ICARUS Reserve.***

In January 2006, the FAA issued TSO approval for the ***ICARUS Reserve*** .

In April 2006, ICARUS Canopies sent a public press release to the skydiving magazines announcing the launching of the ***ICARUS Reserve*** .

During April 2006, ICARUS Canopies released information to all dealers about the ***ICARUS Reserve.***

In July 2006, ICARUS Canopies began delivering ***ICARUS Reserve*** canopies to the market.

Product Specifications

The ***ICARUS Reserve*** is a 7-cell canopy made of low porosity fabric and Spectra lines for reduced pack volume. Sizes are available from 99 to 279 sq. ft (no custom sizes). The ***ICARUS Reserve*** is only available in WHITE.

The ***ICARUS Reserve*** is designed and constructed as a low aspect ratio, 7-cell parachute with a square planform for stability during opening, flight and landing, exhibiting predictable be havior throughout its entire flight.

The ***ICARUS Reserve*** exceeds the requirements of the Aerospace Standard AS8015B, the FAA TSO-C23d and the EASA ETSO-C23d. The rugged construction uses additional reinforcement chordwise, spanwise, throughout the nose, and at all line attachment points.

The ***ICARUS Reserve*** canopy features a low pack volume as compared to other reserve parachutes, thanks to the use of 0-3 CFM low permeability, high quality ripstop fabric (SASPA T-34, PIA C- 44378C Type IV), together with its unique reinforced construction. However, exact pack volume can be affected by many things including environmental factors, packing technique, and even the number of pack jobs on the canopy.

The suspension lines are 725lb Spectra, with the lower steering lines made of 1000lb Spectra. Line attachment points are secured with double bartacks for higher strength. ***ICARUS Reserve*** Spectra lines are coated to assure better protection during packing, opening and after landing, better resisting damage from bushes, sand, Velcro hook, etc….

The ***ICARUS Reserve*** slider includes an opening in the center and extra reinforcement to ensure fast and reliable openings.

The ***ICARUS Reserve*** is manufactured under the highest Quality Control standards. All materials are thoroughly inspected and tested according to military standards (MIL SPECS). The manufacturing process is strictly controlled under ISO 9001:2000, NATO AQAP 2120, and EN9100:2003 for Aerospace Quality Standard, EASA Part 21A.G.

Selecting the appropriate ICARUS Reserve canopy

To select the appropriate ICARUS Reserve size for a jumper, several factors must be taken into consideration. Some of these factors are legal limits and must be respected.

To select the appropriate ICARUS Reserve size, first and foremost, consider the jumper's MAXIMUM EXIT WEIGHT. Make sure that the jumper's MAXIMUM EXIT WEIGHT complies with the certified one for each ICARUS Reserve canopy size, in accordance with FAA TSO C23(d) and EASA ETSO C23d requirements.

The MAXIMUM EXIT WEIGHT for a reserve canopy size is a legal limit. This parachute was tested under US FAA TSO C23(d) and EASA ETSO C23d to maximum exit weights of 255 lbs (116kg). It is forbidden to use any ICARUS Reserve parachute with an exit weight exceeding the MAXIMUM EXIT WEIGHT for which each canopy is certified.

The MAXIMUM EXIT WEIGHT is detailed on the warning label sewn on each ICARUS Reserve, in the ICARUS Reserve manual and in all product documentation that can be found in the ICARUS Canopies website.

Other important factors to consider include the jumper's level of experience. Level of experience may vary from person to person and depends also on number of jumps, type of jumps, basic and additional training and jumper's skills.

Drop Zone physical placement (elevation, winds, weather, ground conditions, etc…) should also be considered. All these factors influence the performance of any given main and reserve canopy.

We recommend selecting the ICARUS Reserve canopy size as similar as possible to the main canopy for safety considerations.

Operational Limitations

Deployment speed is limited on all sizes to 150 knots TAS (true airspeed) at mean sea level.

The ICARUS Reserve was designed to operate and function within these specific weight and speed parameters, while oriented in a “belly to earth” body position

Some body positions during freefall (i.e. head down, stand up, long dives etc.) may enable the user of this parachute to reach speeds beyond those for which the equipment has been designed and tested.

In the event of a premature or unintentional deployment while in these body positions you risk any /all of the following:

- Extremely hard openings
- Equipment failure
- Light to severe injuries
- Death

Never exceed the operational speed or weight limits of the parachute system. You should avoid deploying in an attitude that the equipment was not designed for.

Permitted Wing Loadings

Wing loading can be calculated as follows:

The jumper's total exit weight is the total weight, in pounds, of the jumper's body plus the weight of all the jumper's equipment, including the parachute system itself (normally 20 – 30 pounds) and any additional equipment such as helmets, cameras, etc.

Wing loading is then determined by dividing the jumper's total exit weight (in pounds) by the surface area of the parachute (in square feet).

Example:

- A jumper who weighs 170 lbs wearing his jumpsuit, helmet and altimeter;
- using a packed rig that weighs 25 pounds

The jumper would have an exit weight of 195 pounds .

If this jumper jumps a 169 sq. ft . canopy, he would have a wing loading of 1.15 pounds / square foot: 195 lbs / 169 ft 2 = 1.15 lbs/ft²

A wing loading lower than 0.5 lbs/ft² is unsafe. In unstable atmospheric conditions such as turbulence, such a wing loading may not allow for sufficient pressurization of the parachute. Additionally, forward speed is reduced to the point that penetration into even light winds may not be possible. Therefore, the wing loading range below 0.5 lbs/ft² is NOT allowed.

A wing loading between 0.5 and 0.7 lbs/ft² is considered a light wing loading. It is especially recommended for low experienced jumpers. This wing loading may allow you to make small mistakes, such as an early or late flare, without severe consequences. The parachute is still a little bit sensitive to unstable atmospheric conditions, such as turbulence. In consideration of this, even though other people might be jumping, this wing loading should not be considered safe in unstable atmospheric conditions.

A wing loading in the range from 0.7 to1.1 lbs/ft² is recommended for most jumpers. The parachute will have the best overall performance within this range . This wing loading establishes the best balance between properties like speed, flare power, reactivity, and resistance to adverse atmospheric conditions.

A wing loading between 1.1 and 1.325 lbs/ft² is ONLY allowed for very experienced jumpers who are aware of the dangers associated with flying a highly loaded reserve parachute. Landing a parachute with this wing loading requires a high skill level, especially in small landing areas, at high density altitudes, or in congested traffic areas. At this wing loading, even with a fully deployed parachute, being unconscious or making an error of judgment during landing can still result in serious injury or even death.

A wing loading higher than 1.325 lbs/ft² is unsafe because of the high descent rate even with a fully deployed canopy. At this wing loading, the parachute cannot be expected to save your life if you are unconscious. Therefore, it is NOT allowed to fly in the wing loading range above 1.325 lbs/ft².

According to the US FAA certification limits, it is forbidden to jump with this parachute with an exit weight exceeding 255 lbs (116kg).

Certification

This reserve canopy has been tested and certified, meeting the requirements described in the Aerospace Standard AS8015 Rev. B.

It complies with all the requirements of the EASA ETSO-C23d and the US FAA TSO-C23d.

Technical Specifications

No custom sizes available.

Size	Max. Exit Weight		Max. Speed	Span	
sq.ft.	Kg	Lbs	Knots	M	FT
99	59	131	150	4.4	14.3
109	65	144	150	4.6	15.0
119	72	158	150	4.8	15.7
129	78	171	150	5.0	16.4
139	83	184	150	5.2	17.0
149	89	197	150	5.4	17.6
169	102	224	150	5.7	18.7
189	113	250	150	6.0	19.8
219	116	255	150	6.5	21.3
239	116	255	150	6.8	22.3
259	116	255	150	7.1	23.2
279	116	255	150	7.3	24.0