



## **Fallrates and Glide ratios**

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## **How am I flying?**

For many new wingsuit fliers downward speed is the first thing they start using as a guide to see how well they fly. But there is more to flying a wingsuit than just getting slow fall rates.

There are two things we can measure to gauge the performance of a wingsuit, these are glide ratio, and the fall rate.

### **Fall rate**

This is the most common data we get from a jump. Most audible/logging devices give instant feedback after the jump from data recorded during flight and it is quite easy to see how slow or fast you were falling during any part of your jump. Most people refer to their downward speed in miles per hour (mph)

Normal freefall is around 100 to 140 mph, a wingsuit can fly at anything between 30 and 80 mph on normal jumps.

### **Glide Ratio**

The Glide ratio, sometimes going by the name L/D (short for Lift/Drag), means we look at the comparison of how many meters we travel forward to every meter we go down.

*2:1* for instance, means 2 meters forward, for every 1 meter loss in altitude.

The fundamental principle of wingsuit flight is that we use the force of gravity for propulsion which generates a relative wind which we use to gain horizontal distance. The more efficiently we fly our bodies in a wingsuit the greater the performance we will achieve.

Strength and stamina are a significant factor that comes into play with the type and duration of a flight.

On short BASE jumps (some) people can fly wingsuits at glide-ratios of up to *3:1*, while on flights out of airplanes, glide-ratios around *2:1* are more common.

Though many other variables come into play, such as more direct feedback from the ground, and more dedicated flying on a BASE jump, the biggest difference in flying is the time. 30 seconds to a minute, compared to flights that average 2 to 3 minutes on a conventional skydive.

A GPS is a nice way to record flight data, and which can later be analyze to see how well we have been flying. The only setback is that most GPS units record data that is not always 100% accurate, and though its absolute numbers, its still open to interpretation. And your flight performance also depends on outside factors such as prevailing winds.

### **Wind**

Having a strong tail wind in the back, both in BASE and skydiving, greatly assists in getting more horizontal distance on a jump relative to a fixed point on the ground where as this works the opposite way round when flying into a head wind will result in much lower distance relative to a fixed point on the ground.

## **Ground speed**

When we are talking ground speed, this means taking the Glide-ratio of a wingsuit, and adding the wind speed to that. If you are able to fly a 6 kilometers distance in a wingsuit, excluding any influence from the wind. Then doing so in high tail winds you can actually fly 8 kilometers, or when flying into a head wind the distance is reduced to only 4 kilometers.

Regardless if you fly 4 kilometers on one jump, and 8 kilometers on the next your personal performance could be exactly the same.

## **Time vs Distance**

Taking what we've just learnt, you now understand its possible to choose to fly for either time or for distance.

A canopy flown on brakes will slow down the vertical decent and will slow down the forward speed and get much more hang time, this is very similar if you fly your wingsuit close to a stall. You will however cover a lot less distance. If you adopt a more head down stance and dive a little more and the let the wingsuit fly, like a canopy in full flight, you'll get much more distance, but you get less time up in the air.

As you may realize by now, looking at your fall rate doesn't actually say anything about how you are flying.

## **Build**

Our height and weight also come into play in terms of how well we can fly. The beauty this is, it only affects your fall rate. In theory, everyone can fly the same glide-ratio. It doesn't matter if you weight 60 kg or 100 kg. The only difference is, the heavier person will fly at a much greater speed.

The explanation is very simple. Though a heavy person falls faster, this also means there is more wind passing over his wings, providing more lift. If 2 people exit at the same point, they will open their parachutes at the same point. The only difference will be that the heavy person will arrive there sooner, as his fall rate is higher.

## **Flare**

If you look at the overall specs, wingsuits are quite comparable to canopies.

And just like a canopy, its possible to flare, or swoop a wingsuit.

You can dive the wingsuit to pick up speed, and then pull it out of the dive rapidly.

This will start converting speed into lift, and short, completely level flight is possible that way.

But like a canopy, you can even push it up to the point of a stall. This means your wingsuit looses all lift.

You can feel this in front to back and side to side wobbles.

If you are experiencing unstable wobbling on your normal flights, it also means you are pushing to hard. And your wingsuit is flying close to a stall. Diving a bit more, flying slightly head low, is all it takes to get your suit flying again.

## Going up!

One of the last, but beautiful aspects of wingsuits are high speed tailgate exits. When an airplane flies at a high speed, the onward rushing wind can be sufficient to produce sufficient lift that actually pushes the wingsuit upward into the sky. Airplanes with rear, or tailgate exits are most ideal for this. As doing such an exit from a normal, side-door plane can result in the wingsuit pilot hitting the rear stabilizer.

Contrary to what some people think, it is not the wash of the propeller that is causing the wingsuits to climb. Just the relative wind.

With a wingsuit, you can actually choose to fly for either maximum freefall, or maximum distance.

When you fly the wingsuit a bit 'flaired' (which is usually a bit head-high) it doesn't travel so far, but it uses all lift to stay up in the sky. Giving you maximum freefall time.

When you dive a little bit, all the lift is used to actually make you travel forward. Which means the freefall times will be a bit shorter, but you will be flying much, much further.

## Lets summarize

Fall rate and glide ratios are two different things

*Fall rate* is the speed at which you travel downward.

*Glide-ratio* is the combination of your forward vs downward speed/distance.

Depending on how you fly, you can choose to either go for maximum time, or maximum distance. Fall rates alone are no indicator of how good or bad you are flying.

For more information on wingsuit flight, coaching, articles, and video tutorials be sure to check out [www.flylikebrick.com](http://www.flylikebrick.com) or sign up for our newsletter through [flylikebrick@gmail.com](mailto:flylikebrick@gmail.com)

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