

FOUNDATIONS OF FLIGHT

RAM-AIR PARACHUTE ANATOMY—WING PROPERTIES

Brought to you by Niklas Daniel and Brianne Thompson of AXIS Flight School at Skydive Arizona in Eloy. Image(s) by Bruce Fournier.

In the previous article, we discussed various properties of a wing and how they affect flight performance. In this installment, we take a closer look at the materials used in ram-air parachute construction.

Manufacturers are always on the lookout for the latest and greatest materials to improve on their designs. Most parachutes are constructed using a lightweight woven nylon that has a grid-like appearance when viewed up close. These tiny squares provide the material with great tensile strength and help prevent small tears from getting larger, which is why it is often called “rip-stop” material. However, if you come across a tear in your canopy, no matter how small, have a rigger examine the damage and patch it.

Porosity

Most fabrics encountered in everyday life are porous, meaning they have small holes through which air can travel. A parachute relies on ram-air technology to trap oncoming air in its cell structure, and the material that makes up the structure must not allow air to escape easily. If the fabric is too permeable, the wing will not fly well. Therefore, most modern parachute fabrics have a polyurethane or silicone coating that makes them close to airtight and protects the cloth from the sun's ultraviolet light. The advent of this coated fabric, often

referred to as “ZP” or “zero-p” (zero porosity), was a huge technological leap forward in increasing parachute performance.

Care and Maintenance

Jumping puts unavoidable wear and tear on your gear. There are industry standards for how porous parachute material can be in order for it to be airworthy, and you should have your canopy inspected regularly, especially if you jump in a harsh environment like a desert.

Damaging the fabric's ZP coating makes the cloth more porous, thereby degrading the wing's efficiency in flight. With standard use, porosity deteriorates most rapidly where the wing produces most of its lift—on the top skin near the leading edge. There are other actions and conditions that lead to quicker degradation of your life-saving equipment, which, if minimized, can prolong the life of your gear.

Avoid:

- 1 | Heat and sun exposure whenever possible
- 2 | Dragging your gear on the ground
- 3 | Sweating on your wing during packing
- 4 | Squeezing air through the fabric (unavoidable when packing, so do it slowly). Whenever possible, get most of the air out through the nose before starting your pack job.

AXIS

Flight School®



More educational skydiving content, as well as this free article, is available by downloading the AXIS

Skydiving app on your smart device.

The list goes on. Be good to your gear, and it will be good to you.

Keep in mind that components other than the wing are made of nylon and also need care (and eventual replacement), such as the slider and pilot chute.

In the next issue we will start examining how parachutes interact with the airflow, creating the forces we use to glide.

Information about AXIS' coaching and instructional services is available at axisflight-school.com. The author intends this article to be an educational guideline. It is not a substitute for professional instruction.

