

What are Trip Strips?

Written: March 1, 2022 by Dennis Nunes

Trip Strips – What are they and what do they actually do?

Trip Strips – What are they and what do they actually do? As far as *what* trip strips do and *how* they work other than to disturb the airflow on the surface of the wing and/or stabilizer is beyond comprehension for my simple little brain. All I know is that they worked for me and helped me to a 4th place finish at the 2021 AMA Nationals in Muncie, Indiana. And they might work for you.



2021 AMA Nationals - Top 5 in ADVANCED

For the stabilizer, trip strips removed the majority of a “*hunting*” issue I had with my electric powered *Circulas 46 IIe*. Hunting on a model airplane is where the model rises and lowers in level flight and no matter what you do to control it, it won’t stop and can be difficult to control.

For the wing, the trip strips assist in removing some of the stalling characteristics that can happen in hard corners such as in the bottom of the wingover, square corners and the bottom corner of the dreaded hourglass.

My first set of trip strips (see picture below) were made from the [Crystal Clear Vinyl Static Cling](#) material that was mentioned in the article “*Turning to the Dark Side – The Building of Circulas 46 IIe*”. This article is available to download on the [Flying Lines](#) website. This material is used for signage on glass doors and/or windows. It uses static cling to stick to glass surface. I had the situation where the trip strip came off without me knowing it. So I’m not a big fan of this material or any other material that uses static cling to keep them in place.

My second set of trip strips were made with (2) layers of [Gorilla® Heavy Duty Packaging Tape](#). A single layer of this tape is 3.4 mil thick. Using (2) layers of *Gorilla® Heavy Duty Packaging Tape* will make the trip strips

What are Trip Strips?

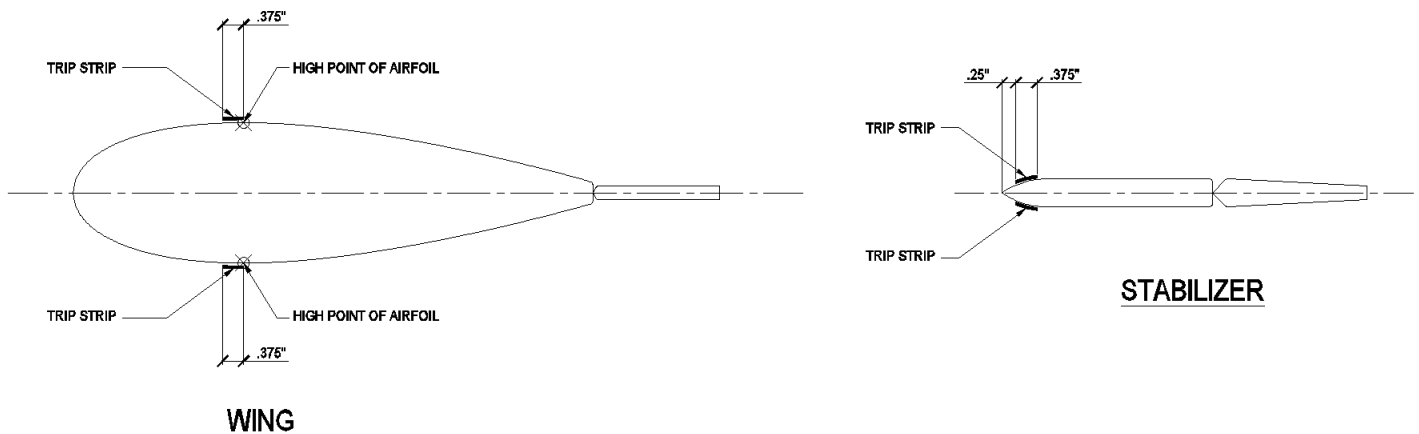
Written: March 1, 2022 by Dennis Nunes

almost .007" thick. The width of the strips are about 3/8". The picture shown below is of the vinyl static cling type with the backing material still attached. *The "wavy edge" always faces towards the leading edge of the stabilizer or wing.* As a result of some further testing, I found that 3 layers of tape worked better for me. See the section, "2-Layer vs. 3-Layer Trip Strips" below. This gave the trip strips a thickness of about .010". You may need to experiment with various thicknesses to find what works best for your plane.



Typical Trip Strip

The trip strips run the full span of the stabilizer and the wing. The location of the trip strips for the stabilizer is about 1/4" from the leading edge to the "wavy" edge. For the wing, the trip strips are located in front of the high point of the airfoil. For me, I located the back edge of the 3/8" wide trip strip on the high point of the airfoil. Again, you may need to experiment with the location of the trip strips to find what works best for your plane.



Trip Strip Location

What are Trip Strips?

Written: March 1, 2022 by Dennis Nunes

2-Layer vs. 3-Layer Trip Strips:

On a cold damp foggy day in Napa, CA my plane was not flying very well. This was due to a considerable amount of condensation that developed on the top and bottom of the wing making the plane difficult to fly. The plane was flying as if I lost the trip strips on the wing. Interestingly, as the temperature rose and the air dried out, the plane returned back to its normal flying characteristics.

Dave Fitzgerald, who I was flying with, ran his finger on the front edge of the trip strips and discovered that some areas along the front edge of the trip strips were very smooth as if the trip strip had blended into the wing. Later at home when I removed the trip strips I found that dirt and wax had collected and built up on the edge of the trip strips. This was probably caused from the adhesive of the tape attracting dirt like a magnet. Also, I had some wax build up from polishing the plane.

I ended up replacing the trip strips with new one made with 3 layers of tape. In my next flying session I found that these worked even better! I've come to the conclusion that that trip strips need to be somewhere between .0075" to .010" in thickness to have any telltale effect.

A side effect of the thicker trip strips was that the battery capacity dropped from 17%-20% to 14%-17% and the lap times dropped from 5.25 seconds to 5.35 seconds. This probably is a result of increased drag of the thicker trip strips, but I'm not completely sure. However, the plane flew even better. I still need to test these new strips in cold damp foggy conditions of Napa. I'm really not looking forward to that!

Please keep in mind that it's not the number of layers used, but the total thickness of the trip strips that matters. I'm still looking for another "clear" material with the same thickness as 3 layers of Gorilla tape but with an adhesive that is not so strong. If you know of one please let me know.

Tools and Materials Used:

Here are some of the tools and material used to make your own trip strips.

The [Rotary Cutter](#) is available at Walmart, eBay or a fabric store for around \$20-\$30. I got my on eBay.



Figure 1 - OLFA 45 mm Rotary Cutter



Figure 2 - "Pinking" blade for the Rotary Cutter

What are Trip Strips?

Written: March 1, 2022 by Dennis Nunes

You will also need to get a ["Pinking" blade](#) for the rotary cutter. This is what makes the wavy cut portion of the trip strips. Again Walmart or fabric store should have them. I got a package of two blades for \$6 on eBay.

come in black, green or blue. Again, I was able to purchase mine on eBay for \$30 back in 2020.

The other tools needed are a long metal straight edge, an X-ACTO® knife, *Windex*® and plastic squeegee

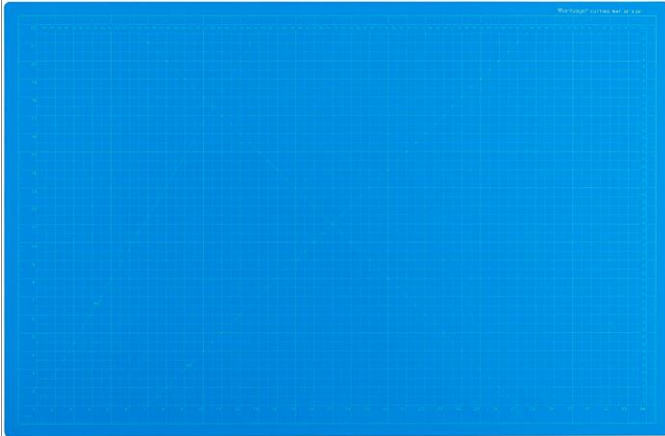


Figure 3 - Self-Healing Cutting Mat, 24"x36"

Shop around for a [Self-Healing Cutting Mat](#) as these can be very expensive. Colors available



Figure 4 - Gorilla® Heavy Duty Clear Packaging Tape

A roll of [Gorilla® Heavy Duty Packaging Tape](#). This tape is usually available at Home Depot or Lowes for around \$9.

Making Trip Strips:

The *Gorilla® Heavy Duty Packaging Tape* is extremely sticky and really sticks to just about anything. Spray a small amount of *Windex*® on to the cutting mat. The *Windex*® allow the tape to be moved and positioned on the cutting mat. Take a length of *Gorilla® Heavy Duty Packaging Tape* and stick it to the cutting mat. Using a plastic squeegee, remove any air bubbles and excess *Windex*® under the tape and make sure the tape is laid straight. Spray some more *Windex*® and take another length of *Gorilla® Heavy Duty Packaging Tape* and lay it directly on top of the first strip. Again, take a squeegee and remove all air bubbles and *Windex*®. Repeat this process for the third layer of tape.

I "square up" the edge of the (3) layers of packaging tape with the metal straight edge and X-ACTO® knife. Move the metal straight edge down 3/8". Make sure the metal straight edge is held firmly into place. Don't let it shift on you. I temporarily tape the straight edge to the mat and tabletop. Take the rotary cutter equipped with the "pinking" blade and roll the blade along the side of the straight edge. You will need to press firmly with the cutting wheel to cut through the three layers of packaging tape. Once you start moving the cutting wheel DON'T STOP! Cut from one end of the tape to the other end. Please remember, the "pinking" blade is extremely sharp and cuts whatever rolls under the blade. Keep your fingers out of the way!

Move the metal straight edge down another 3/8" and make a cut using the X-ACTO® knife. This should give you two lengths of trip strips. Cut a few more just in case something goes awry.

Now it's just a matter of carefully peeling the trip strips from the cutting mat, spray a little *Windex*® on the wing/stabilizer and place them on the plane.

What are Trip Strips?

Written: March 1, 2022 by Dennis Nunes

Removing Trip Strips:

You will notice that the *Gorilla® Heavy Duty Packaging Tape* sticks really well to any smooth surface. In fact, one individual wrote me that when he went to pull the trip strip from the cutting mat, it pulled off part of the top coating of the cutting mat! With this sort of “sticking power” can make it very difficult to remove from the wing/stabilizer. All my plane are painted with butyrate dope and the trip strips stick really well to this surface. Hence, it can be difficult to remove these strips once they been applied on the wing/stabilizer for some time and can damage the finish if one is not careful.

NOTE: I do not recommend applying these strips to a newly finished plane! Wait until the finish is completely gassed off and is cured.

To remove the trip strips, I use a heat gun on the lowest heat setting possible. Apply heat to the trip strip, but make sure to keep the heat gun constantly moving. Do not leave the heat gun stay located in one spot, keep it moving. The heat will loosen the adhesive and allow you to pull the strip off. Be careful and go slowly.

With my first trip strips made with 2-layers of Gorilla tape, I wanted to replace these strips with the 3-layer strips. Once I removed the strip I found that dirt and tape residue along the edges where the trip strip was placed. This residue can be difficult to remove. I used *WD-40® Multi-Use Lubricant* and a soft cloth to remove the residue, followed by some window cleaner to clean the area.

Conclusion:

There you have it – everything you wanted to know about trip strips and were afraid to ask! Don't be afraid or hesitant when it comes to using trip strips. Don't be afraid of experimenting with various sizes, thicknesses and the locations of trip strips. Just like each plane is different, so can the effect of using trip strips be different.

If you have any questions or comments please send me an email at: circulas46iie.2020@gmail.com. I will try and get back to you as soon as I can. In the meantime, stay safe and have some fun!

Dennis Nunes