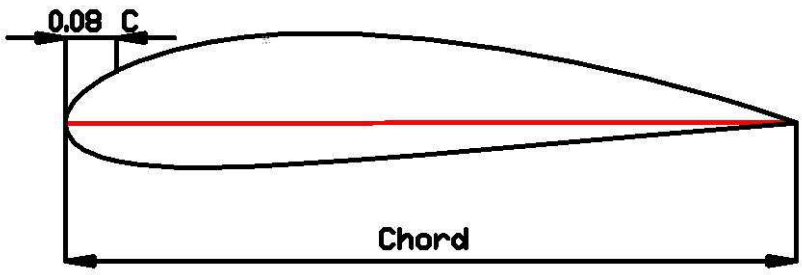
Installation of Vortex Generators

Preliminary remark:
Vortex generators will not fix incorrectly flying aircraft, wrong balanced, or having inadequate geometry.
These are devices that clearly improve the characteristics and properties of the airplane near stall speed, while reducing the stall speed and increasing critical angle of attack.

Vortex Generators from Aero-Service has been developed for ultra-light, LSA and experimental aircraft.

The greatest influence on the effectiveness of vortex generators, is their location on the wing. If they are placed too far away from the leading edge, their performance during the stall will be negligible. This is due to the boundary layer, and the separation. If vortex generators are placed too close to the leading edge, it can cause increased drag. It's better to mount farther forward than too far aft leading edge.
Vortex generators from Aero-Service, should be mounted on the wing just 7-9% of the chord length measured from the leading edge to the front of vortex generator. (a measuring method - see figure)

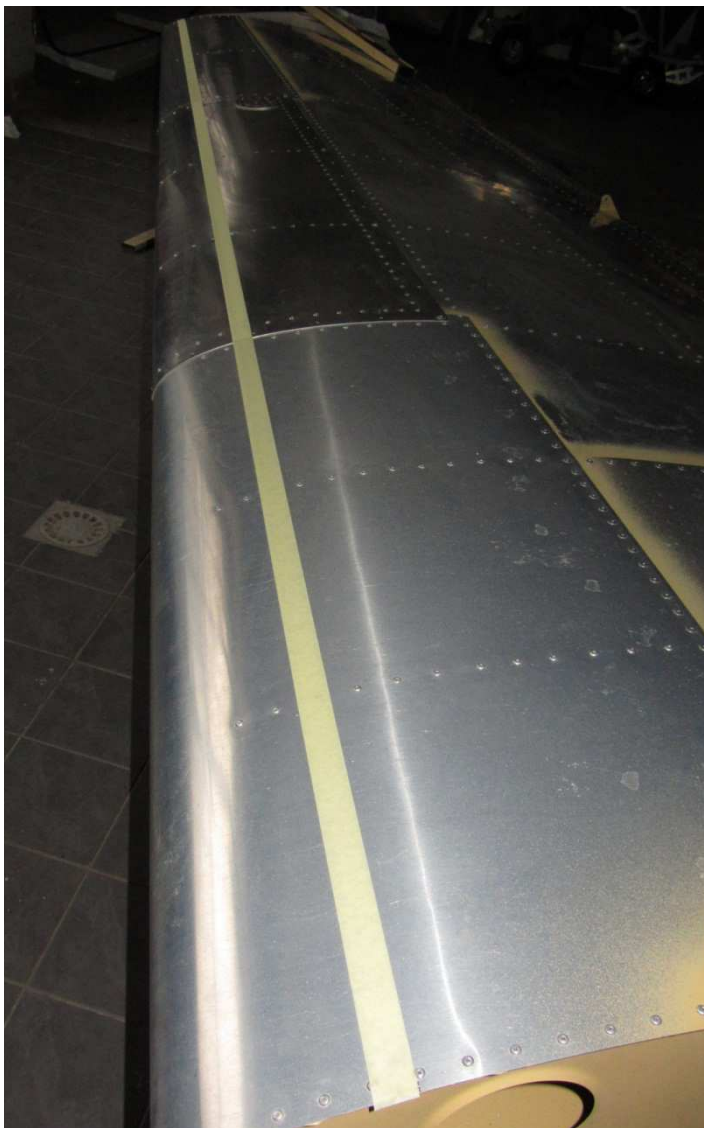


This is the distance that gives the best and certain results. The permissible range is considered to be 6-10% of wing chord back from the leading edge to the front of vortex generator proper assembly is greater than 6 and up to 10% of the chord length. For the type of aircraft and airfoil, the best mounting location can be determined by a thorough flight testing, it is a labor-and time-consuming, but allows you to get the best results. Differences arising from small shifts of vortex generators usually are minimal, so you should start doing the test from the extreme positions and the middle position, and thus choose the optimal position. Flight testing should also be performed to accurately compare the performance and properties of the aircraft before and after instalation of vortex generators.

Installation on wings

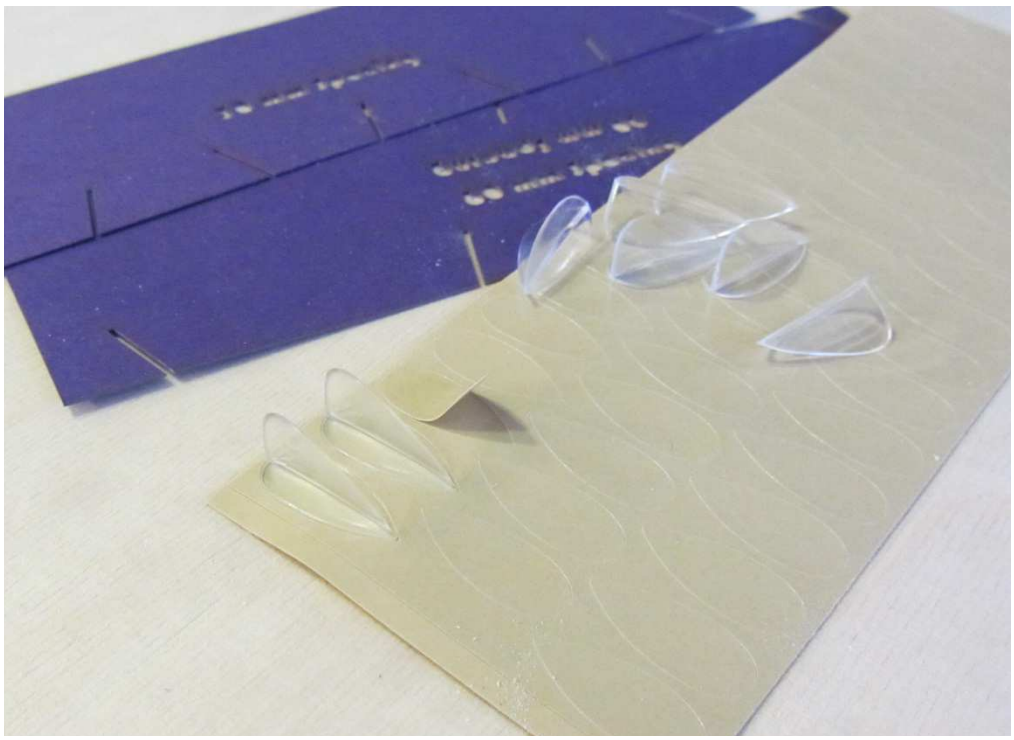
1. First, determine the mounting location of vortex generators. Calculate 7% (or more) of wing chord. If you do not know the chord length - it should be measured. For tapered wings, calculations and measurements are made for two positions: at the wing tip, and at the root. For wings with rectangular outline at just one. In the case of wings with flaperons (eg stol 701, Avid, Kitfox), the measurement is made including them.
2. Mark calculated length on the wing. Aircraft should be leveled. Measure from a vertical line extended above the leading edge. A carpenter's level is very useful for this work.

In most cases (rectangular wing contour), dimension at the tip will be the same as at the root. Then we mark a line along two measured points. We can do this for example with masking tape. The resulting line is a place where we install front tip of vortex generators.



Note: In the case of a tapered wings, place vortex generators at angle of 15 ° to the airflow not to the leading edge! In this case, we cut the edges of the templates included in the kit to maintain proper spacing.

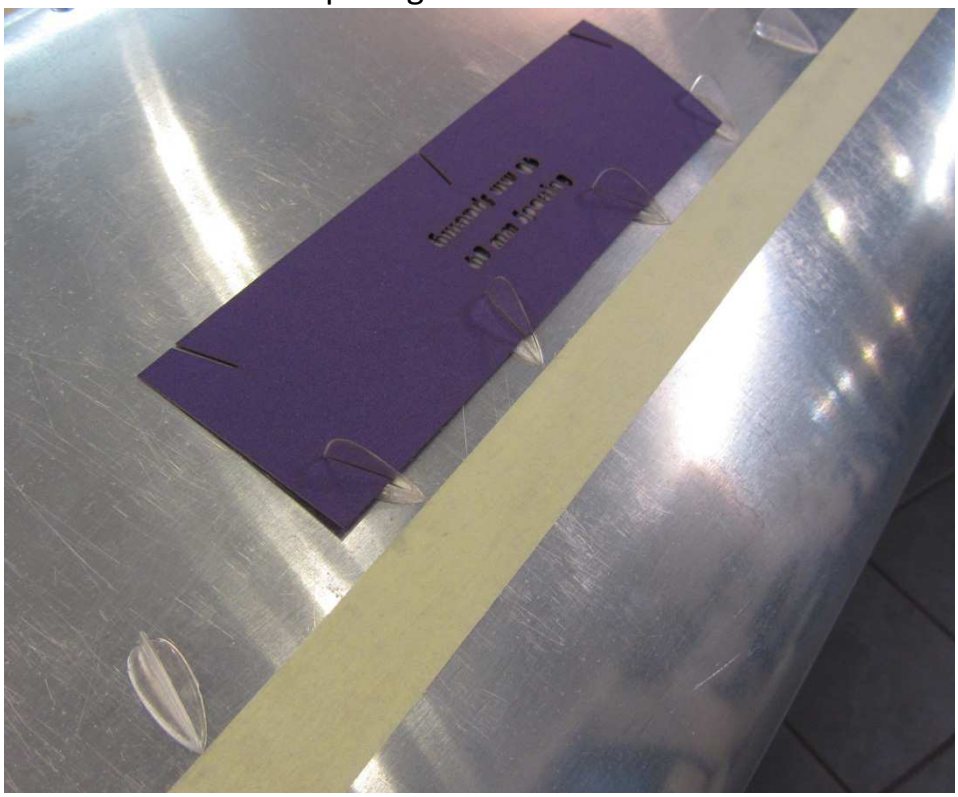
3. Now you have to prepare vortex generators included in the kit, special self-adhesive sheets, and surfaces of wings and / or stabilizers. Surfaces should be clean and free of grease. Self-adhesive sheets are specially cut to facilitate and speed up the installation process.



Before placing VG's to adhesive their base should be degreased. The ambient temperature for the use of adhesive may not be less than 15°C. In the case of bonding at a lower temperature, the manufacturer does not guarantee a permanent bonding.

Note: The radius of the base was selected to fit most applications. But if it happens that the radius of the base is too small in relation to the wing, light sanding is acceptable.

4. Start placing VG's about 50mm from each wing tip. From the tip, place 16 VG's with 60mm spacing. On the remaining portion of the wing place VG's with 90mm spacing



Installing on horizontal stabilizer

Note: Install VG's on the underside of stabilizer

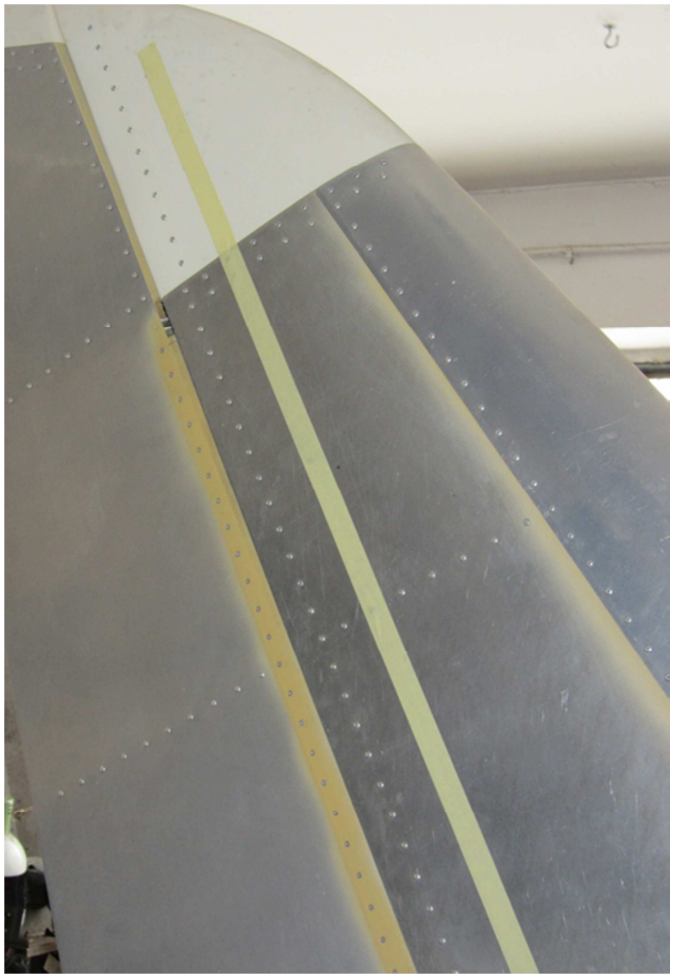
1. The line indicating the front of vortex generators should be marked 100mm (4”) in front of the gap/hinge between the stabilizer and the elevator.
2. Use template with 30mm spacing

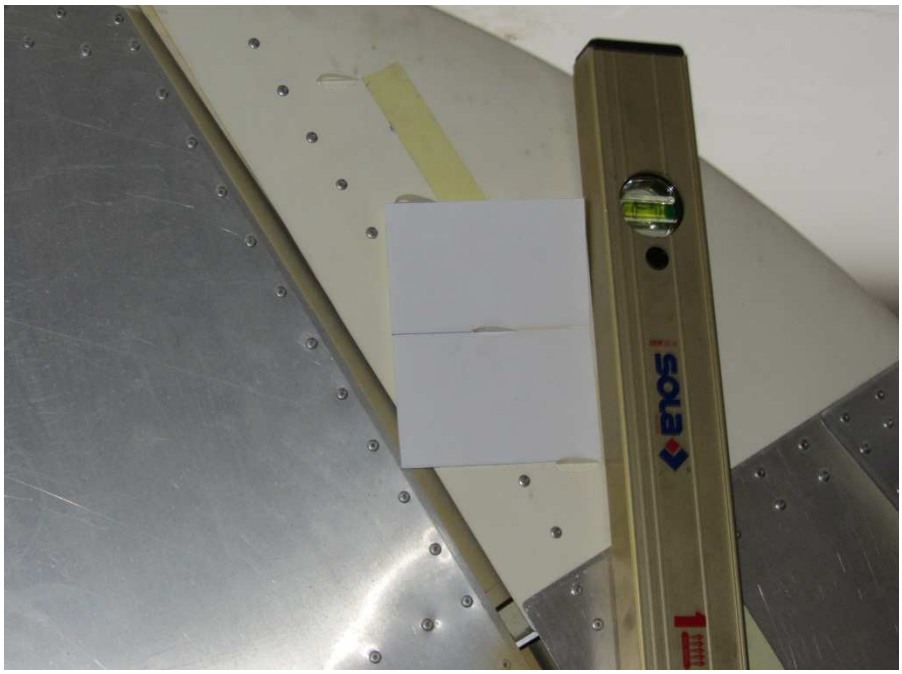
Installation on vertical stabilizer

Make installation on both sides of the vertical stabilizer

Arrangement and angles of Vortex generators the vertical stabilizer are a bit different:

1. The line indicating the front of vortex generators should be marked 90mm in front of the gap/hinge between the stabilizer and the ruder.
2. Use template with 70mm spacing
3. The angle of VG's should be between 0 and 5 ° relative to the direction of air flow in the horizontal flight, so that during landing the aircraft with nose up, this angle does not exceed 20 °. We recommend angle of 4 ° , and template with this angle is included in the kit. It is best to level the aircraft before installation





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