

elfin news

emotions — freedom — dreams

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NAMING OUR HIGH PERFORMANCE E-POWERED MOTOR GLIDER

As the first aircraft components are popped out of the moulds, it was time to finalize the naming of our great 'baby'. We want it to show clearly RS.aero's elfin will be positioned firmly in the 20m wingspan competition class.

Hence we decided to name our aircraft the **REINER STEMME elfin 20.e**, and the **REINER STEMME elfin 20.ex** for the version equipped with a range extender. REINER STEMME is the name of the founding father of the Stemme series of high performance motor gliders, the number '20' indicates the wingspan and that we are entering the 20m FAI competition class, 'e' finally stands for the all-new electric powertrain.

ACTIVE TRADE SHOW PARTICIPATION IN 2018

AERO FRIEDRICHSHAFEN 2018

The *elfin* concept points without any doubt to where soaring flight will turn to in the future – and how enjoyable flying-for-two will look like. That exactly was the impression many visitors took away from our presentations at the SIEMENS booth, our partner for the 70kW e-drive system. There was a rush in the e-flight hall at Aero 2018 to get a good look at the *elfin*, keeping the RS.aero team busy all the time. They were supported by Zedia-Aviation, the European distributor of the *elfin*. Enthusiastic pilots and fans of e-mobility not only had a chance to learn about the state of development of the *elfin*, but also saw the entire Siemens drive system ‚in the flesh‘.

Pilots of all types of aircraft were intrigued by the *elfin*'s wide range of applications, starting at the 20m competition two-seater configuration with 70 kW take-off power, all the way to the touring cruiser version with a range of more than 540 nm, enabled by the ‚clip-on‘ RangeExtender. All this comes with a panoramic-view cabin giving space to pilots up to 2 m tall, and a low sill for easy entry.

We also noted vivid interest expressed for the *elfin*'s low operating and maintenance costs and the level of operational safety. The *elfin* is a perfect fit for group-ownership. It is easy and safe because it has much less critical components than previous generations of motor gliders. Last but not least, the visitors enthusiastically endorsed the prospects of a drastic reduction in workload: no more than a single lever is needed to switch fully automatically between powered and soaring flight modes in just three seconds.

All in all, the show was a tremendous inspiration and encouragement for us to forge ahead- next year the *elfin* will be seen flying as well as displayed on the ground at airshows.

FIRST SALES SIGNED DURING AERO

In addition to constructive discussions and suggestions for the engineering team, the signing of the first customer sales contract during the press conference was the highlight at AERO 2018.

After Lars Muth, design-team leader at RS.aero, had given a presentation of the *elfin* program, Pierre Steffen was the first customer to sign a sales contract during the AERO press conference. He thus expressed his confidence in Reiner Stemme and his innovative aircraft, a mature concept justifying an investment in the *elfin* before it had ever flown.



ILA BERLIN 2018

Berlin's International Aviation Show (ILA) is not exactly a typical showcase for soaring planes – but Berlin is our home and we took this opportunity to present our innovations in the political environment at our doorstep as well as the result of the support received from the aviation research program of the Germany's Federal Ministry for Economic Affairs and Energy, BMWI.

Electric hybrid drives have a firm place in the future of aviation – and as with all fundamental innovations, start-up periods tend to be long. We have entered the field with the *elfin*, a pioneer with a production start in 2019, and received a remarkable amount of attention. Our approach to close the gap between glider and powered airplane by harnessing the potential of an electric hybrid drive was noted very positively. This is due to the fact that the *elfin* combines the two in one - without compromising flight performance or comfort.

At ILA, we had a joint booth with the Berlin-Brandenburg Aerospace Alliance (BBAA) in the International Supplier Center (ISC). Valuable contacts were made with experts from the purchasing and development departments of leading OEM manufacturers and first tier suppliers.

MAKING THE *ELFIN*

HIGH-END PRECISION MOLD CONSTRUCTION FOR SERIES PRODUCTION

Mold making is progressing well, the master models of the fuselage and outer wings are completely milled and will be prepared for carbon fiber vacuum infusion.

Using carbon fiber PrePreg material means that the curing temperature during the manufacturing process must rise to more than 135 degrees Celsius. Consequently all lamination molds have to be made of carbon fiber, too, to avoid component-distortion at high temperature during the annealing process.



Picture 2 – fuselage master model



Picture 3 – carbon fiber mold for the outer wing

WINGLET

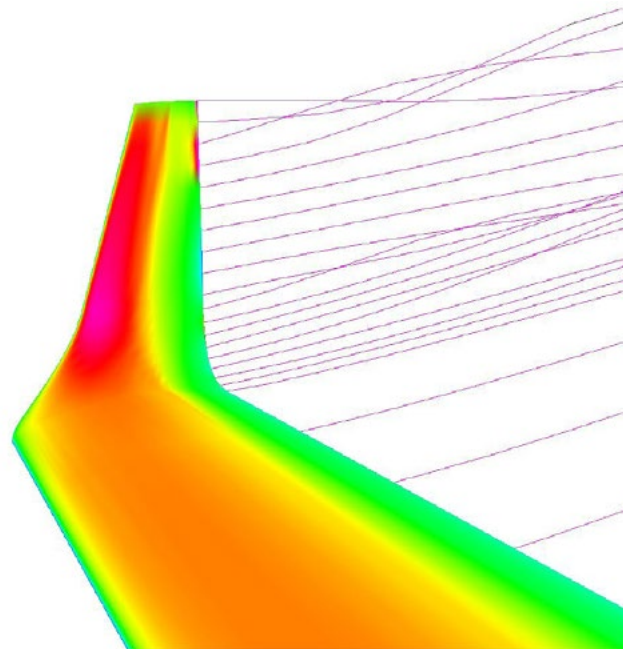
The aerodynamic design of a high performance glider in the L/D 50 glide ratio class comes down to an exercise in extensive fine tuning. Winglets reduce induced resistance by guiding the leading edge vortices overboard. They also increase the efficiency of the ailerons, resulting in better flight characteristics overall. However, a poorly designed winglet will ruin performance completely, especially at higher cruising speeds.

The basic design parameters are:

- wing area
- aspect ratio
- twist angle
- angle of incidence
- taper

The winglets of the elfin are tailor-made to specifically fit the aircraft wing shape and wing profile. Optimal wing efficiency throughout all flight configurations was achieved applying VSAERO™ software (innovative computational fluid dynamics analysis method). Particular care was taken not to overload the winglet aerodynamically, which would have resulted in suction peaks. Also, we saw no airflow separation issues at the winglet root.

At low air speeds, the winglets increase performance by about 5% compared to no winglets.



graphics 4 + 5 – boundary vortex and pressure distribution at the winglet



With best wishes for the gliding season,

Yours, Reiner Stemme

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