

Newsletter September 2019



Milestone for weight reduction of fuselage shell brilliantly achieved!

The prototype fuselage shell achieves the weight reduction target of more than 25 % weight reduction compared to wet lay-up and former construction methods. In numbers: One side fuselage shell in the prepreg construction method, incl. sandwich and integrated stringers weighs only 25 kg! For an airplane with 280 km/h VNE!

Next steps are the installation of the main bulkhead and the battery compartment for 21 kWh nominal capacity (see also Annex 1.1).

The individual components are cured at 130 C in several steps for several hours. That is a considerably higher temperature than typically used for wet lay-up (approx. 80 °C). However, it is not only cured at significantly higher temperatures, but also heated up much faster. To achieve the required heat-up rate of slightly under 2 °C per minute, the oven needs more power than the propulsion system of the *elfin* can deliver.

Despite the relatively high curing temperatures, the prepreg material (consisting of carbon fibres and resin) is one of the low-temperature prepreps which makes the use of an autoclave superfluous (hence the name Out-Of-Autoclave Prepreg). Due to the precise fibre volume adjusted in the factory, the quality of the finished components is on the next level. That enables the full exploitation of the material characteristics. Additionally, even more structural weight can be saved through secondary effects, like smaller gaps between components due to higher precision.

Along the way, countless tricks and solutions were developed to achieve the ambitious goals. The small distance between the development and production teams is very helpful. Designers and technicians worked not next to each other but collectively to produce the fuselage shell. This has led to constant ideas for improvements in design and manufacturing processes.

The large number of individual work steps is repeatedly interrupted by pre-compacting or debulking (application of vacuum) in order to prevent pores from forming in the component during curing in the oven. Fabrics, UD strips for local stiffening and the foam pieces as sandwich material must be arranged in correct position and sequence. Here the exact cutting and creation of the templates are the prerequisites for the great results we want.



To the best of our knowledge, no other glider manufacturer has gone this way and dared to make the change towards this new technology. We put all that effort into this, just to offer pilots a better sailplane!

The results so far confirm that we have made the right decision to go the innovative way.

We are working successfully to deliver the best e-hybrid glider to our customers.

In the next news: status e-hybrid propulsion