Experiences with the Archaeopteryx – footlauchable Micro Lift Sailplane

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A Dream of Menkind:
Spread your arms, run, and fly!

Lilienthal, Derwitzer Apparat 1891

Ruppert, Archaeopteryx 2011
1999 – 2003
Development, Construction and Testing of the Conzept-Demonstrator at the ZHAW in Winterthur.

2006 – 2009
Development and Testing of the Series-Version by Ruppert Composite in cooperation with ZHAW and Industry-Partners.

2010 – 2015
Delivery to customers, small series production, intensive flying, flight-school, Cross Country Flights
Electric Motorised Version
### Archaeopteryx

#### Airplane data

- **Wing Span**: 13.6 m
- **Wing Area**: 12.8 m$^2$
- **Length**: 5.7 m
- **Flaps**: -7° to +70°
- **Speed**: 30 … 130 km/h
- **Minimum Sink**: 0.5 m/s
- **Best Aspect Ratio**: 28
- **Empty Weight**: 54 kg (Basic Version, includes Parachute)
- **Cockpit-Cladding**: 6.7 kg
- **Recovery Parachute System**: 5.5 kg
- **Max. Wing Load**: 12.8 kg/ m$^2$
- **Safe Loads**: Manoeuvre +4 g / -2 g, Gust +5.1 g / -3.1 g
Extraordinary Features

- Minimum Weight (Empty Weight starting with 54 kg)
- Very slow Minimum Speed (30 km/h)
- Excellent Controllability in all Configurations
- Adaptable by Wing with Flaps
- Simple to fly - good stall behaviour
- Slow and precise thermaling,
  minimum circle radius at 45° bank: 15 m
Archaeopteryx

Versions

Now also available with electric propulsion

«Standard» – open

«Race» – with full cover
Technology

- Thin walled laminates
- New technology: Wing integral Shell-/Ribs in Carbon
- Integral design for fuselage components
- Cockpit in differential construction out of integral components
- Cockpit cladding separate (Aramit)
- Completely manufactured in precise CNC-milled moulds

→ manufactured like a high performance sail plane
Launch Methods

- Foot launch
- Bungee launch (without help of others)
- Trike-Tow
- Aero Tow (max. 100 km/h)
- Car Tow
- Winch launch (small winch)
- Self launch with electric engine

Landing characteristics

- Glide angle control with flaps
- Slow short final glide
- Precise landing on small area
- Touch down on wheel
- Possible to land with feet
Classification

**Certification:** Hang-glider (Germany UL-Sailplane)

**Pilot licence:** Basic training in double seater sailplane recommended

**Sportive Classification:** Hang-glider Class 2  
Sailplane Class Microlift
Archaeopteryx

Pilot Training

1. Basic Training in Sailplane

2. Ground instruction Archaeopteryx

3. Training flights with the Archaeopteryx after check flight with a flight instructor.
   First Archaeopteryx flights with car launch

4. Flight examen, Licence (if recommended)

5. Instruction into alternative launch methods
Flying with the Microlift-Glider ...

- Is comfortable and relaxing.
- Even with low cloud base and little operation height
- Good climb possibilities even in low altitude
- Slow hang soaring even at micro ridges
- Wave flights possible if wind speeds are below 60 km/h
The original feeling…

… of flying is especially sensed by light and slow flying: to use micro-lifts, slow hangsoaring with relish, Take-off from a hill or an airfield and stressless flying even in low altitude. Circling up in a narrow screw. Cross country flying – of course!

A certain sensitivity to wind belongs to extrem light sailplanes.
Archaeopteryx

Climb performance

Minimum sink like a modern sailplane – Circling like a paraglider or bird

Gaining height starting from 0.7 m/s upwind in the centre.
Cross country performance

Classical cross country flights of the Archaeopteryx in thermals.

Can use early morning late afternoon thermals

Closed tasks (out and return, triangle, …) up to:

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<th>Weak day</th>
<th>Medium day</th>
<th>Good day</th>
<th>Very good day</th>
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<td>100 – 200 km</td>
<td>200 – 300 km</td>
<td>300 – 400+ km</td>
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Safety aspects

- Half the speed of a „normal“ glider
- One forth of the mass
- Only 1/16 of the kinetic energy
- More recognition- and reaction time for the pilot
- Simple landing procedure to small fields
- Parachute recovery system
Recovery system

Specially developed, and tested 5.5 kg light Recovery system.

68 m² Parachute newest technology for lowest sink rate.

Small rocket edjection works in low altitude.

Pilot harness linked to parachute all the time.
Archaeopteryx

Keep seated!

Emergency situation in 2010. Non allowed acrobatics at a flight exhibition in France. Structur overloading due to overspeed after a first loop and pulling too much. The wing held 8g!

The pilot released the parachute 3 secnds after the wing rupture. After additional 3 sec. the sink rate with parachute stabilized at 4 m/s.

The pilot was not injured (and ordered a new Archaeopteryx).
Hang-glider customer
«The first winter showed us the tremendous opportunities with flight durations from 3 - 4h. Really new experiences. In Spring our expectations were more than satisfied by distance flights up to 550 km and FAI triangles up to 330 km.»

Sail plane customer
«Genious light, can land everywhere, lifts like a feather, bungee launch is fantastic, easy to fly, aero-tow works also well, …»

Paraglider customer
«It’s fun! Much easier than expected. Using foot-launch to fly around the Mt.Blanc, nothing climbs better…»

Testpilot
«The Archaeopteryx opens new horizons of soaring.»
Archaeopteryx
Go for new horizons

www.archaeopteryx.ch Light-weight Engineering & Composite Manufacturing