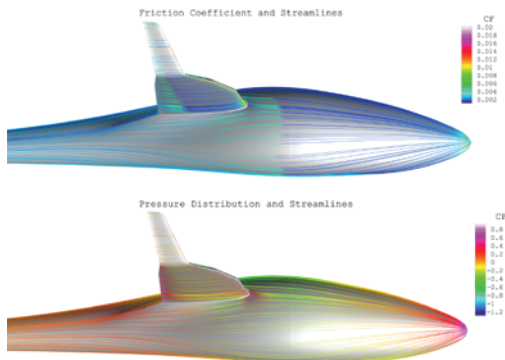


elfin **RS10.e**

SPECIFICATIONS



DATA

EXTERNAL DIMENSIONS	
Wing span	65.6 ft (20 m)
Wing aspect ratio	24.7
Wing area	266 sqft (16.2 m ²)
Length overall	28.5 ft (8.7 m)
Height over tail plane	5.6 ft (1.7 m)
Wheel track	3.9 ft (1.2 m)
Wheelbase	18 ft (5.5 m)
INTERNAL DIMENSIONS	
Cockpit width	4.1 ft (1.25 m)
Cockpit height	3.2 ft (0.98 m)
Cockpit entry sill height	2.8 ft (0.96 m)
WEIGHTS & LOADING	
Operating empty weight	1,190 lbs (540 kg)
MTOW	1,984 lbs (900 kg)
MTOW without water ballast	1,808 lbs (820 kg)
Wing loading	7.8–11.4 lbs/sqft (38–55.5 kg/m ²)
Max. cockpit loading	441 lbs (200 kg)
PERFORMANCE (unpowered)	
Glide ratio	50:1 class
PERFORMANCE (powered by batteries)	
Never-exceed speed V _{NE}	151 kts (280 km/h)
Manoeuvring speed V _A	108 kts (200 km/h)
Stalling speed	42 kts (78 km/h)
Range (RS10.e)	T/O to 1.640 ft (500 m) + 1h powered flight
PERFORMANCE (with RangeExtender)	
Range (RS10.ex)	540 NM (1.000 km)
Cruise (RS10.ex) @ FL100	115 KTAS (215 km/h)

TYPE

Two seat side-by-side high performance electro/hybrid aircraft/glider FAI 20m class.

PROGRAM

- Reiner Stemme established a new company to meet the challenge of **electro-hybrid powered flight** for a new class of aircraft and glider in ONE
- **closing the gap between two worlds of aviation:**
 - competition soaring up to long distance level
 - soaring safaris as in “Wandersegelflug of Wolf Hirth” and A-to-B travelling
- the enabling concept is Reiner Stemme’s **patented retractable propeller system and the Siemens based e-system**
- resulting in a **fuselage with zero drag penalties** for high soaring performance and,
- long-range capability by a quick-mounted hybrid **underwing pod with generator and integrated IC engine.**
- steplessly adjustable power for dynamic saw-tooth flight with **automated single lever propeller/power ON-OFF control.**

CURRENT VERSIONS

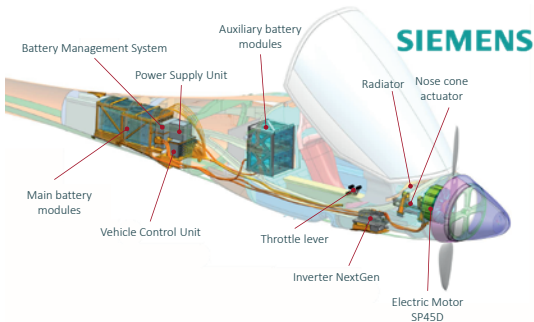
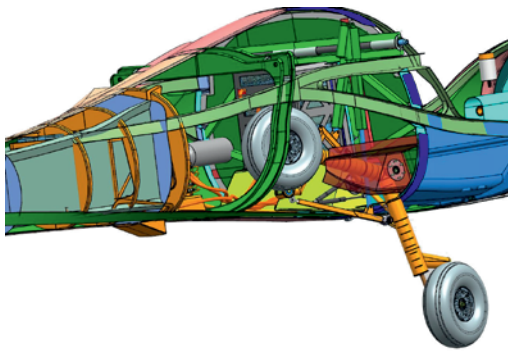
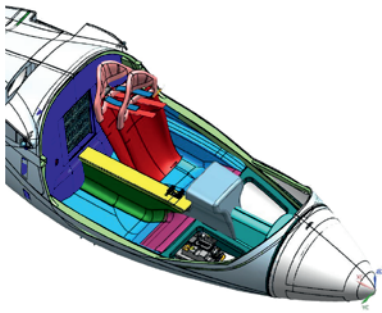
- elfin RS10.e:** electric self-launch base model with up to one-hour electric powered level flight, competition soaring performance of 50:1 glide ratio, tow release.
- elfin RS10.ex:** 1000 km (540 NM) touring/travel performance with under wing hybrid power pod, quick-mount-system.

DESIGN FEATURES

- Side by side cockpit in front of wing with panoramic view and low sill for easy entry
- retractable propeller system
- directly coupled electric motor in fuselage nose
- main battery in rear compartment for best mass balance
- auxiliary battery behind cockpit at CG
- specific wing airfoil RS10-143 without premature lift plateau, seamlessly optimized over the entire wing span
- ambitious wing-to-fuselage-intersection design with fillets for drag reduction
- turbulent root section airfoil and root twist
- outer wings foldable to 36.25 ft (11.05 m) wingspan for taxiing and hangaring
- inner wing lengthwise pivoting over fuselage for 9 m by 2 m (30 x 6.5 sqft) overall footprint
- enhanced safety through full ballistic parachute recovery system
- certification EASA CS-22 and FAA equivalent.

SAFETY

- The aircraft will be equipped with a total recovery parachute system to enhance survivability in emergencies close to the ground. In addition, the seats are designed for use of individual pilot safety parachutes. The canopy can be jettisoned by a single-handle („Röger-hook“ design); an audio-visual warning systems alerts for airbrake mispositioning (the source of numerous accidents).
- cockpit integrity structure complies with increased demands of CS-22.
 - integrated position lights; anti-collision and ELT systems.
 - mounting brackets for two oxygen tanks in the cockpit.



FLIGHT CONTROLS

- conventional with flaperons for overall manoeuvrability and easy handling at low airspeeds
- automatic electric flaperon control for improved flight performance
- Schempp-Hirth type airbrakes in centre wing
- optional: level I autopilot for long distance travel.

STRUCTURE

The entire structure is made of innovative carbon fibre prepregs to achieve considerable weight reduction which translates directly into larger power packs. The fuselage is built as a single unit, reinforced by four stringers running from the rear to the forward bulkhead. In the bottom centre of the fuselage heavy-duty stringers protect the airframe in case of a gear-up emergency landing. The fuselage shells are of sandwich design and the single spar wing in three sections is of sandwich shell design. The centre wing span runs to 9.9 m (33 ft), and the outer wing mass is less than 30 kg (66 lbs). A 180 kg (397 lbs) water ballast tank and a fuel tank for the range extender pod are included in the center wing.

LANDING GEAR STRUCTURE

Retractable main gear, electrically actuated, independent left and right brake circuits, wheel size 5.00-5 for soft grass fields. Rubber column suspension struts for high energy absorption. Retractable and steerable tailwheel.

CABIN COMFORT

Two pilots, side by side; unobstructed panoramic view; seats adjustable for position and rake for pilots between 1.6 m and 2 m height (5.3 to 6.6 ft); forward hinged canopy with gas struts; heating from engine cooling air and/or electric heating blanket; low sill height of 96 cm (38 in) for easy entry and exit.

PROPULSION SYSTEM

Siemens SP45D at 70 kW peak and 45 kW continuous power, mounted in aircraft nose with cooling through controlled ram-air intake. REINER STEMME automatic actuated retractable propeller system. Power packs will be of the 2019 design, constantly benefitting from progress in the automotive industry. Battery fire protection fully complies with stringent EASA/FAA demands.

SYSTEMS

12 V system, battery charged by electric propulsion system. Electrical actuators for main landing gear, retractable tailwheel and retractable propeller.

AVIONICS

Base "fly away" version as well as customer tailored models.

MAINTENANCE

Maintenance costs of the e-powered motor glider are significantly reduced by up to 80% when compared to a conventional powered motor glider of the same class.

RANGE EXTENDER RS10.EX

IC and e-generator system for 30-45 kW continuous power; weight about 60 kg (132 lbs); easy one person mounting by integrated lift device (ground handling like pushing a trolley); fuel tank inside center wing.

GROUND HANDLING

Outer wing folding to 36.25 ft (11.05 m) span for taxiing and hangaring; lift-and-rotate inner wing 90° to lengthwise position over fuselage for storage in trailer or on 9 m x 2 m (30 ft x 6.5 ft) hangar space (option).

FLIGHT OPTIONS

Oxygen system, special avionic system, first-level autopilot.

FLEXIBILITY OF OPERATION:

COMPETITION

180 kg (397 lbs) water ballast and main battery only for optimized wing loading of 38-55.5 kg/m² (7.8-11.4 lb/sqft); take-off either by aero/winch/ car-tow or self-launch with sufficient battery capacity remaining to get home safely.

BEST ALL-ROUND SOARING

Full battery capacity installed (main and auxiliary battery); take-off either by tow or self-launch; 1h electric flight at 100 kts after self-launch to 500 m (1,640 ft); up to 200 kg (440 lbs) cockpit load plus 20 kg (44 lbs) baggage.

TOURING AND SCENIC FLYING

Main battery and Range Extender installed; more than 6 hours powered flight, 1,000 km (540 NM) range; up to 200 kg (440 lbs) cockpit load plus 20 kg (44 lbs) baggage.

UNPOWERED

Even without propulsion the *elfin* is a high-performance two-seater, launched by winch, air- or car-tow.