E-PROPS PLUG'n'FLY

DATA SHEET / INSTRUCTIONS MANUAL

REF : HEP-2019-03-26E

Plug'n'Fly CARBON PROPELLERS FOR PARAMOTORS

Top of the range carbon propellers

- ✗ PLUG'n'FLY = **HI-TECH propellers** for paramotors and light planes
- ✗ The **world's lightest propellers** : less than 500 gr for a 2-blade !
- ✗ Very strong : **100% carbon**, HCF process, Nanostrength® leading edge protection
- ✗ For all reducted engines or electric motors, from 10 to 50 kW
- ✗ **Thousands of models** : 2-blade, 3-blade, 4-blade and 6-blade
- ✗ Diameters : from 115 cm to 160 cm, each 5 cm
- ✗ Models each 0,5° pitch and in both rotation senses (CW and CCW)
- ✗ **ASTM F2506-13** certified
- ✗ Made in France since 2008
- ✗ E-PROPS production : **30.000 blades / year**
- ✗ Propellers sold in more than **80 countries**

PLUG'n'FLY models	**The E-PROPS are designed and manufactured in France** (Sisteron, Provence) since 2008. They equip all sets of engines–reducers : from 2 to 6 blades, in diameters from 115 to 160 cm (each 5 cm), both senses CW & CCW, with pitch every 0,5° → **thousands of E-PROPS models**. They are present in more than **80 countries**.
E-PROPS Design	Propellers of 3rd generation : efficient, very strong and ultra-light. High CL profiles by Helices E-Props (software *LmPTR*). Diameters and blades' numbers defined according to engines and reducers. The secret of their exceptional performances ? Specific E-PROPS design with high CL profiles, thin chords and SCIMITAR shape : more thrust, less inertia, fuel economy and noise reduction.
Weight	Some models weigth less than 420 gr : about 30 to 60% less than competitor props. The E-PROPS are by far **the world's lightest propellers**.
Blades	**100% carbon** + epoxy resin. Optimum use of carbon fibers braid to obtain ultra-light and strong blades. Foam core with D-Box. RTM manufacturing process. Carbon braid, with continue fibers between upper and lower surfaces of the blade. The HCF (Helical Continuous Fibers) process, especially designed by E-PROPS, ensures an exceptional strength all along the blade.
Blade's foot	Propellers very simple to assemble, as a puzzle. Thickness of the blade's foot : **28 mm** for classic range / **38 mm** for SCIMITAR range.
Leading edge protection	**Strong internal leading edge protection**. Shielding of the blades : injection at the leading edge of a special resin with Nanostrength® (ARKEMA product : high kinetic energy absorption capacity).

WARNING : *the propeller is NOT an accessory. It is a vital part of the aircraft. The propeller has to be assembled, tightened and correctly maintained according to the E-PROPS instructions.*

THE USE OF E-PROPS PROPELLERS ON AN AIRCRAFT IS UNDER THE CUSTOMER'S RESPONSIBILITY ONLY

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Tips	E-PROPS has made extensive research on the blades tips, with many tests on different configurations : rounded, cut with angles, with upper or lower winglets... The best performances and the lower noise are reached with a straight cut tip.
Finish	Finish with **shiny polish**. No gel-coat, no paint, no varnish, because the E-PROPS company has a eco-responsible approach. The carbon braid remains visible, and each blade is unique.
Balancing	The E-PROPS are balanced on an electronic bench. Be careful : the blades do not necessarily have the same weight. To balance a propeller, the weight of blades is important, but what is really critical is the weight distribution all along the blade, called **static moment**. It is strongly forbidden to add weight to one blade, in order to have the same weight for all blades. A bad balancing can cause vibrations and can damage the engine.
Moment of inertia	Moment of inertia of each model calculated then verified on the tests bench. Strict respect of the limitations of the engines manufacturers.
Traceability	On each blade : reference of the model and **unique serial number** (4, 5 or 6 numbers). A RFID chip is inserted in each blade, with all technical data inside, for a strict quality control.
Blade's replacement	**It is possible to change only a blade**. It is not necessary to send the remaining blade back to E-PROPS. Our team just needs the unique serial number of the blade.
Small impacts Repairs	Small impacts can be easily repaired (epoxy resin, small sanding). A repair kit is available by E-PROPS. To know if a blade can be repaired, send pictures of the damages to E-PROPS by email, with the serial number of the blades. If an incident or a shock require an important repair, this one must be made by E-PROPS or an agreed repairing center.
Certification	The E-PROPS meet the **ASTM F2506-13** specifications, which cover the establishment of the requirements for the design, testing, and quality assurance of fixed-pitch or ground adjustable propellers for light sport aircraft.
Mechanical Strength / Tests	E-PROPS design department is doing centrifugal load tests on all its models. Carbon propeller can hold **4 times the maximal load** during 1 hour without any damages (AESA standards ask for 2 times for certified aircraft).
Tracking	The maximum static tracking is **8 mm** (tracking is not important if there are no vibrations). Never put a rubber washer between propeller and reducer : the screws could break.
Dynamic Gap	Dynamic gap : up to 20 mm (the blade can move towards the engine at max power). This gap is depending on the engine assembly, on the cage and on the silent-blocks. It is recommended to part the propeller from the cage of minimum 40 mm. Be careful : the propeller must turn without risk to touch any part.
Torque	Imperative : assembly and tightening with a **tightening plate** (provided with the engine). Tightening torques, measured with a calibrated torque wrench : **Screws 6 mm = 8 N.m** **Screws 8 mm = 16 N.m** Nominal torque of the screws gradually in 3 successive operations, tightening using cross pattern.
Max RPM	**3.000 RPM** (RPM measured at propeller = max engine RPM / reduction ratio)
Max power	Depending on models (ask E-PROPS) : **from 10 to 50 kW** on engines with gearbox. Never put a PLUG'n'FLY propeller on combustion direct drive engines.
Maintenance	Maintenance before each flight: visual inspection of the propeller and check of the screws. Periodic maintenance: check of the screws tightening every 25 hours of flight or every 3 months. Cleaning with a sponge, with some water with soap, or with a product for windows cleaning.
Orders	Orders through the e-shop : **ppg.e-props.fr** General Terms and Conditions of Sale : see the updated version on the e-shop Payment with : PAYPAL / CREDIT CARD / BANK WIRE Express worldwide shipping (DHL / FEDEX / UPS...)

=> any question : **helices@e-props.fr**

Fly safe !