



Standard Specification for Design and Performance of a Light Sport Airplane¹

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1. Scope

1.1 This specification covers airworthiness requirements for the design of powered fixed wing light sport aircraft, an “airplane.”

1.2 This specification is applicable to the design of a light sport aircraft/airplane as defined by regulations and limited to VFR flight.

1.3 *Units*—The values given in this standard are in SI units and are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound (or other) units that are provided for information only and are not considered standard. The values stated in each system may not be exact equivalents. Where it may not be clear, some equations provide the units of the result directly following the equation.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- F2316 Specification for Airframe Emergency Parachutes
- F2339 Practice for Design and Manufacture of Reciprocating Spark Ignition Engines for Light Sport Aircraft
- F2483 Practice for Maintenance and the Development of Maintenance Manuals for Light Sport Aircraft
- F2506 Specification for Design and Testing of Light Sport Aircraft Propellers
- F2538 Practice for Design and Manufacture of Reciprocating Compression Ignition Engines for Light Sport Aircraft
- F2564 Specification for Design and Performance of a Light Sport Glider

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

F2746 Specification for Pilot's Operating Handbook (POH) for Light Sport Airplane

F2840 Practice for Design and Manufacture of Electric Propulsion Units for Light Sport Aircraft

2.2 *Federal Aviation Regulations:*³

14 CFR Part 33 Airworthiness Standards: Aircraft Engines

14 CFR Part 35 Airworthiness Standards: Propellers

2.3 *EASA Requirements:*⁴

CS-22 Sailplanes and Powered Sailplanes

CS-E Engines

CS-P Propellers

2.4 *Other Standards:*

GAMA Specification No. 1 Specification for Pilot's Operating Handbook⁵

3. Terminology

3.1 Definitions:

3.1.1 *electric propulsion unit, EPU*—any electric motor and all associated devices used to provide thrust for an electric aircraft.

3.1.2 *energy storage device, ESD*—used to store energy as part of a Electric Propulsion Unit (EPU). Typical energy storage devices include but are not limited to batteries, fuel cells, or capacitors.

3.1.3 *flaps*—any movable high lift device.

3.1.4 *maximum empty weight, W_E (N)*—largest empty weight of the airplane, including all operational equipment that is installed in the airplane: weight of the airframe, powerplant, Energy Storage Device (ESD) as part of an Electric Propulsion Unit (EPU), required equipment, optional and specific equipment, fixed ballast, full engine coolant and oil, hydraulic fluid, and the unusable fuel. Hence, the maximum empty weight equals maximum takeoff weight minus minimum useful load: $W_E = W - W_U$.

3.1.5 *minimum useful load, W_U (N)*—where $W_U = W - W_E$.

³ Available from Federal Aviation Administration (FAA), 800 Independence Ave., SW, Washington, DC 20591, <http://www.faa.gov> or <http://ecfr.gpoaccess.gov>.

⁴ Available from EASA European Aviation Safety Agency, Postfach 10 12 53, D-50452 Koeln, Germany, <http://easa.europa.eu>.

⁵ Available from the General Aviation Manufacturers Association, <http://www.gama.aero/>.