Exemption No. 10829

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20591

In the matter of the petition of

ICON AIRCRAFT

for an exemption from §§ 21.181(a)(3), 21.190(a), 43.3(c), 43.7(g),61.89(c), 61.303(a), 61.315(a), 61.411(a), 61.415, 61.429(b), 65.107(b) and 65.107(c) of Title 14, Code of Federal Regulations

Regulatory Docket No. FAA-2012-0514

GRANT OF EXEMPTION

By letter dated May 7, 2012, Mr. Kirk Hawkins, CEO & Founder, ICON Aircraft (ICON), 12511 Beatrice Street, Los Angeles, CA 90066, petitioned the Federal Aviation Administration (FAA) on behalf of ICON and persons operating, maintaining, providing flight training in, and performing preventive maintenance on its Model A5 aircraft for an exemption from §§ 21.181, 21.190, 43.7, 61.23, 61.31, 61.89, 61.303, 61.305, 61.315, 61.317, 61.321, 61.325, 61.327, 61.403, 61.411, 61.415, 61.417, 61.419, 61.423, and 61.429 of Title 14, Code of Federal Regulations (14 CFR). The proposed exemption, if granted, would allow the ICON Model A5 to be certificated, operated, and maintained under the regulations applicable to aircraft issued a special airworthiness certificate in the light sport category while incorporating a spin-resistant airframe (SRA) at a maximum takeoff weight (MTOW) of 1,680 pounds.

To obtain the desired relief, the petitioner requires exemption from the following regulations:

> Section 21.181 prescribes, in pertinent part, that:
> (a) Unless sooner surrendered, suspended, revoked, or a termination date is otherwise established by the FAA, airworthiness certificates are effective as follows:
> (3) A special airworthiness certificate in the light-sport category is effective as long as—
> (i) The aircraft meets the definition of a light-sport aircraft;
>
> Section 21.190 prescribes, in pertinent part, that:

(a) *Purpose*. The FAA issues a special airworthiness certificate in the light-sport category to operate a light-sport aircraft.
Section 43.3 prescribes in pertinent part, that:
(c) The holder of a repairman certificate may perform maintenance, preventive maintenance, and alterations as provided in part 65 of this chapter.

Section 43.7 prescribes in pertinent part, that:
(g) The holder of a repairman certificate (light-sport aircraft) with a maintenance rating may approve an aircraft issued a special airworthiness certificate in light-sport category for return to service, as provided in part 65 of this chapter.
Section 61.89 prescribes in pertinent part, that :
(c) A student pilot seeking a sport pilot certificate must comply with the provisions of paragraphs (a) and (b) of this section and may not act as pilot in command—
(1) Of an aircraft other than a light-sport aircraft;

Section 61.303(a) prescribes in pertinent part, that:
(a) Use the following table to determine what operating limits and endorsement requirements in this subpart, if any, apply to you when you operate a light-sport aircraft. The medical certificate specified in this table must be in compliance with § 61.2 in regards to currency and validity. If you hold a recreational pilot certificate, but not a medical certificate, you must comply with cross country requirements in § 61.101 (c), even if your flight does not exceed 50 nautical miles from your departure airport. You must also comply with requirements in other subparts of this part that apply to your certificate and the operation you conduct.

If you hold	**And you hold**	**Then you may operate**	**And**
(1) A medical certificate	(i) A sport pilot certificate,	(A) Any light-sport aircraft for which you hold the endorsements required for its category and class	(*1*) You must hold any other endorsements required by this subpart, and comply with the limitations in § 61.315.
	(ii) At least a recreational pilot certificate with a category and class rating,	(A) Any light-sport aircraft in that category and class,	(*1*) You do not have to hold any of the endorsements required by this subpart, nor do you have to comply with the limitations in § 61.315.
	(iii) At least a recreational pilot certificate but not a rating for the category and class of light sport aircraft you operate,	(A) That light-sport aircraft, only if you hold the endorsements required in § 61.321 for its category and class,	(*1*) You must comply with the limitations in § 61.315, except § 61.315(c)(14) and, if a private pilot or higher, § 61.315(c)(7).
(2) Only a U.S. driver's license	(i) A sport pilot certificate,	(A) Any light-sport aircraft for which you hold the endorsements	(*1*) You must hold any other endorsements required by this subpart, and comply with the

		required for its category and class.	limitations in § 61.315.
	(ii) At least a recreational pilot certificate with a category and class rating,	(A) Any light-sport aircraft in that category and class,	(*1*) You do not have to hold any of the endorsements required by this subpart, but you must comply with the limitations in § 61.315.
	(iii) At least a recreational pilot certificate but not a rating for the category and class of light-sport aircraft you operate,	(A) That light-sport aircraft, only if you hold the endorsements required in § 61.321 for its category and class,	(*1*) You must comply with the limitations in § 61.315, except § 61.315(c)(14) and, if a private pilot or higher, § 61.315(c)(7).

Section 61.315 prescribes, in pertinent part, that:
If you hold a sport pilot certificate you may act as pilot in command of a light-sport aircraft, except as specified in paragraph (c) of this section.

Section 61.411 prescribes in pertinent part, that:
Use the following table to determine the experience you must have for each aircraft category and class:

If you are applying for a flight instructor certificate with a sport pilot rating for . . .	**Then you must log at least . . .**	**Which must include at least . . .**
(a) Airplane category and single-engine class privileges,	(1) 150 hours of flight time as a pilot,	(i) 100 hours of flight time as pilot in command in powered aircraft, (ii) 50 hours of flight time in a single-engine airplane, (iii) 25 hours of cross-country flight time, (iv) 10 hours of cross-country flight time in a single-engine airplane, and (v) 15 hours of flight time as pilot in command in a single-engine airplane that is a light-sport aircraft.

Section 61.415 states in pertinent part, that:
If you hold a flight instructor certificate with a sport pilot rating, you may only provide flight training in a light-sport aircraft and are subject to the following limits:
(a) You may not provide ground or flight training in any aircraft for which you do not hold:
(1) A sport pilot certificate with applicable category and class privileges or a pilot certificate with the applicable category and class rating; and
(2) Applicable category and class privileges for your flight instructor certificate with a sport pilot rating.

Section 61.429 states in pertinent part, that:
If you hold a flight instructor certificate, a commercial pilot certificate with an airship rating, or a commercial pilot certificate with a balloon rating issued under this part, and you seek to exercise the privileges of a flight instructor certificate with a sport pilot rating, you may do so without any further showing of proficiency, subject to the following limits:
(b) You must comply with the limits specified in § 61.415 and the recordkeeping requirements of § 61.423.

Section 65.107 states in pertinent part, that:
(b) The holder of a repairman certificate (light-sport aircraft) with an inspection rating may perform the annual condition inspection on a light-sport aircraft:
(1) That is owned by the holder;
(2) That has been issued an experimental certificate for operating a light-sport aircraft under § 21.191(i) of this chapter; and
(3) That is in the same class of light-sport-aircraft for which the holder has completed the training specified in paragraph (a)(2)(ii) of this section.
(c) The holder of a repairman certificate (light-sport aircraft) with a maintenance rating may—
(1) Approve and return to service an aircraft that has been issued a special airworthiness certificate in the light-sport category under § 21.190 of this chapter, or any part thereof, after performing or inspecting maintenance (to include the annual condition inspection and the 100-hour inspection required by § 91.327 of this chapter), preventive maintenance, or an alteration (excluding a major repair or a major alteration on a product produced under an FAA approval);
(2) Perform the annual condition inspection on a light-sport aircraft that has been issued an experimental certificate for operating a light-sport aircraft under § 21.191(i) of this chapter; and
(3) Only perform maintenance, preventive maintenance, and an alteration on a light-sport aircraft that is in the same class of light-sport aircraft for which the holder has completed the training specified in paragraph (a)(3)(ii) of this section. Before performing a major repair, the holder must complete additional training acceptable to the FAA and appropriate to the repair performed.

The petitioner supports its request with the following information:

The petitioner states that including a spin-resistant airframe (SRA) in the ICON A5 will result in an aircraft that exceeds the maximum takeoff weight (MTOW) found in 14 CFR § 1.1 for light-sport aircraft intended for operation on water, or 1,430 pounds (650 kilograms). According to ICON, an additional 250 pounds is necessary to implement its SRA technology without compromising other safety features, resulting in a MTOW of 1,680 pounds (762 kilograms) for the model A5.

The petitioner states that the incorporation of an SRA in the ICON A5 at a weight above that specified in the light-sport aircraft (LSA) definition will enable a level of safety over and above that fully considered when the regulations for special light-sport aircraft (SLSA) were created. According to ICON, including an SRA in the A5 design will address a primary cause of pilot-related fatal accidents – loss of control (LOC). The petitioner states that spin-resistance is a major safety-enhancing feature for light aircraft and can significantly reduce the number of loss-of-control accidents resulting from stall/spin scenarios.

The petitioner states that in January of 2012, the ICON A5 proof-of-concept vehicle successfully completed spin-resistance flight testing and demonstrated spin-resistance in accordance with the full envelope of the 14 CFR § 23.221(a)(2) standard. ICON further states that few production aircraft have attempted to achieve spin-resistance to that standard, and no conventional production aircraft without a canard has ever been completely successful due to the technical difficulty of meeting this requirement. Although there are other aircraft that have incorporated some spin-resistance characteristics (i.e., Ercoupe, Jetcruzer, and Cessna Corvalis), the ICON A5, according to the petitioner, will be the first production aircraft in history to be designed to, and actually meet, the full-envelope Part 23 standard for spin-resistance.

The petitioner states that due to the unique physical constraints that spin-resistance presents, it cannot be included in the design under the MTOW as currently defined for SLSA products without compromising other safety features. To achieve their spin-resistant technology, ICON claims that their design requires a significantly increased wing area. ICON asserts the increased wing area then in-turn requires increased tail size for stability, along with a corresponding increase in internal structure and a proportional accommodation for weight. ICON states further that the increased wing, tail, and specific spin-resistance elements also result in an increase in aerodynamic drag, which requires increased engine size and additional fuel to compensate.

The petitioner states that sport pilots should be allowed to train in and operate the ICON A5 in order to benefit from the safety improvements realized from spin-resistant aircraft. Also, according to ICON, in order to assure the ICON A5 can be kept in an airworthy condition in the cost-effective manner envisioned by the regulations governing SLSA, these aircraft should be maintained by repairmen (light- sport aircraft) like any other

SLSA. The petitioner states that the addition of spin-resistance does not add complexity to the maintenance aspects of the aircraft.

The petitioner states that this exemption unequivocally serves both safety and public interest and thereby represents the responsible regulatory decision. ICON further states the long term benefits of their SRA technology, if made available to the public for LSA, will have a profound impact on increasing aviation and public safety. In addition, ICON states that due to the price point of light-sport aircraft like the A5, a larger percentage of the general public can afford the aircraft. Therefore, according to the petitioner, granting this exemption is important so that these widely available products are as safe as technology allows.

Summary of Comments Received:

A summary of the petition was published in the Federal Register on May 24, 2012, (77 FR 31063). Subsequent to the closure of the original comment period a notice reopening the comment period was published in the Federal Register on July 17, 2012, (77 FR 42075). The FAA received 103 comments during and shortly after the requested comment periods that were considered. Four of these were duplicate submittals. Of the submissions, forty-five (45) commenters were in favor of the petition submitted by ICON and fifty-four (54) commenters were in opposition to ICON's petition.

The forty-five (45) commenters in favor of the petition support the additional weight of the ICON A5 SRA design as a safety enhancement. Forty-four commenters state the ICON A5 design will improve safety, reduce the likelihood of fatal accidents due to stall/spin LOC scenarios and will be a significant innovation in LSA. Two commenters assert that the SRA design will produce no discernible adverse effect on stability or controllability, as has been claimed by those opposed to the request. Eight commenters also stated that the current weight restrictions for LSA should be lifted for all designs so all producers of LSA could benefit from a higher weight.

The fifty-four (54) commenters in opposition to ICON's petition are concerned with the safety of the SRA design. Five commenters claim the design will result in increased stall/spin accidents due to limited control authority. Thirteen commenters suggest that ICON should certify the aircraft to Part 23, or Primary Category standards, and not to SLSA standards. Seven commenters state that certain features, such as the aircraft's folding wings and its automotive-like interior should be removed to reduce the total amount of weight being requested. Twelve commenters suggest that this petition, if granted, would give ICON an unfair advantage over other LSA manufacturers and would not benefit the public. Four commenters suggest a weight increase for all LSA.

Additional Information Provided by ICON Aircraft at the FAA's Request:

At the FAA's request, on May 9, 2013, ICON Aircraft provided the following additional information in support of the FAA's analysis of ICON Aircraft's petition:

1. ICON Drawing No. ICA007990 Rev. A, dated 02-May-13, which provides dimensioned, three-view drawings and an isometric view of the Model A5 design that ICON Aircraft claims meets the requirements of 14 CFR § 23.221(a)(2)
2. A list of the flight test conditions in which ICON Aircraft claims it confirmed the model A5 meets the requirements of 14 CFR § 23.221(a)(2)
3. A description of the manner in which ICON Aircraft confirmed the model A5 meets the requirements of those 14 CFR § 23.221(a)(2) standards that encompass other part 23 sections which differ from the consensus standards for light-sport aircraft
4. A signed statement attesting that the A5 design:
    a. meets the requirements of 14 CFR § 23.221(a)(2) subject to the roll and yaw limits allowed by ASTM F2245 for coordinated and uncoordinated stalls
    b. does not incorporate a stick pusher or other automatic flight control system to achieve satisfactory stall characteristics or spin resistance
    c. includes an indicator that provides angle-of-attack (AOA) and sensed AOA rate information to the pilot
    d. has a demonstrated descent rate of 20 ft/s (1200 ft/min) or less during a fully developed, wings-level, power-off stall at the most unfavorable weight and center of gravity combination
    e. has a demonstrated altitude loss of 300 feet or less during recovery from a wings-level, power-off stall at the most unfavorable weight and center of gravity combination
    f. includes a ballistic recovery complete-aircraft parachute system that will comply with ASTM International Standard F2316
    g. complies with the pilot force requirements of ASTM International Standard F2245-12c
    h. includes a propulsion system with a maximum power output of 100 kW (135 horsepower) or less, regardless of flight phase or de-rating of the engine
    i. incorporates interior panels separating and protecting occupants from flight controls, cables, and other systems
5. Clarification that inflatable restraints are not incorporated in the design of the Model A5
6. An explanation of ICON Aircraft's plans for defining a standard LSA maintenance program, and a description of the reasons for ICON Aircraft's claim that LSA Repairmen should be permitted to maintain the model A5

7. An explanation of the factors leading to ICON Aircraft's request that a grant of its petition include a requirement for persons exercising the privileges of a repairman certificate (light-sport aircraft) to receive and maintain an ICON authorized certificate of training on repair and maintenance of the ICON A5 in order to perform work on the aircraft
8. An explanation of the factors leading to ICON Aircraft's request that a grant of its petition include a requirement for persons operating the aircraft while exercising the privileges of a sport pilot certificate to have received ICON authorized training on the aircraft

Some of the above information provided by ICON Aircraft is proprietary. All nonproprietary information submitted by ICON Aircraft has been placed in the docket.

The FAA's analysis is as follows:

Background

The Aircraft Certification Service (AIR) Strategic Plan for Light-Sport Aircraft aligns LSA safety goals with the top-level goals identified in the FAA's strategic vision – *Destination 2025*. Both documents are available on the FAA website and have been placed in the docket. In striving to achieve the safety goals set forth in these documents, the FAA recognizes the existence of a safety continuum in which the public expects progressively higher levels of safety assurance as aircraft complexity, passenger carrying capability, and operational usage advance from recreational aviation, through small type-certificated aircraft, and up to large aircraft used for air carrier and other types of service. The agency establishes safety standards consistent with this continuum by balancing the level of certitude, appropriate level of safety, and acceptable risk for each segment of general aviation (GA). The anticipated operation of the aircraft plays a major role in establishing this continuum and in setting appropriate safety standards.

Within the LSA segment of the safety continuum, the FAA has designed its rules to establish appropriate regulatory standards to permit individuals to safely operate aircraft for the purpose of sport and recreation. The weight limits specified for LSA account for certain provisions that provide an additional safety benefit, such as ballistic parachute recovery systems and other safety enhancing features. The typical weight of these features was considered in establishing a MTOW for LSA that was greater than proposed in the original Notice of Proposed Rulemaking, *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft* (67 FR 5268; February 5, 2002). The FAA believes it achieved an acceptable balance between enabling innovation and regulating safety in the regulations governing the certification and operation of light-sport aircraft. While the LSA regulations do not prevent the introduction of SRA, the FAA did not consider the weight of SRA technology compliant with 14 CFR Part 23 spin resistance standards in establishing the MTOW for LSA.

Analysis

The FAA has reviewed ICON's request for an exemption to allow its model A5 to be certificated under the regulations applicable to SLSA while incorporating an SRA at a MTOW of 1,680 pounds (762 kilograms). In conducting our review to determine whether granting the request would provide a level of safety at least equal to that provided by the rules or not adversely affect safety, and be in the public interest, we considered a number of factors. These factors include: the FAA's strategic goal to reduce fatal GA accidents, the established safety continuum, the FAA's approach to regulatory oversight of small type-certificated airplanes and light-sport aircraft, public comments, information provided by ICON, and our own research.

As mentioned in ICON's petition, LOC accidents continue to be a major concern for GA and they remain the largest source of fatal GA accidents, including in recreational aircraft. The use of SRA technology is being proposed by ICON to specifically address LOC accidents by allowing the A5 to remain controllable in the stall, to resist spins, and to descend at a slow rate in stall due to its wing loading and control characteristics.

The FAA has determined that the ICON A5 design incorporates features that will permit the ICON A5 to be certificated as an SLSA at a MTOW above that specified in the definition for LSA. These features include: (1) spin resistance meeting the requirements of 14 CFR § 23.221(a)(2); (2) an angle of attack (AOA) indicator that includes an indication of sensed AOA rate, allowing the pilot to identify margin above stall; (3) aerodynamic characteristics and reversible flight controls that provide stall recovery capability and spin resistance without the use of a stick pusher or other automatic flight control system; (4) design features that allow recovery from a stall with an altitude loss of 300 feet or less; (5) aerodynamic characteristics that limit the vertical descent rate to 20 ft/s (1200 ft/min) or less during a fully developed stall; (6) interior panels separating and protecting occupants from flight controls, cables, and other systems; (7) a ballistic recovery complete-aircraft parachute system in compliance with ASTM International Standard F2316; (8) a propulsion system with a maximum power output of 100 kW (135 horsepower); and (9) compliance with ASTM International Standard F2245-12c, to ensure appropriate minimum control forces, proper control harmony and balance, and the avoidance of pilot induced oscillations or over-control of the aircraft. The FAA believes that the inclusion of these features in the aircraft permits the certification of the ICON A5 as an SLSA without adversely affecting safety, even though its MTOW exceeds that specified for an LSA.

The FAA notes that it has previously issued exemptions to certificate "roadable" aircraft that exceed the MTOW specified for LSA not intended for operation on water in order to accommodate ground drive systems and equipment required by other regulatory agencies. The agency, however, has previously been very circumspect in limiting such grants to exceed the MTOW for LSA only to aircraft that have design features that clearly were not contemplated in rules originally established for the certification of LSA. The combined design features and SRA concepts incorporated into the ICON A5 design to

avoid excessive descent rates and altitude loss while maintaining controllability during stall, combined with demonstrated spin resistance meeting 14 CFR part 23 standards, are recognized by the FAA as significant safety enhancements not contemplated in the regulations. Accordingly the FAA agrees with commenters who support the additional weight of the ICON A5 SRA design as a safety enhancement that will improve safety, reduce the likelihood of fatal accidents due to stall/spin LOC scenarios, and be a significant innovation in LSA.

The FAA disagrees with commenters who assert that the design will actually result in increased stall/spin accidents due to limited control authority. This could be a concern if reducing stall/spin susceptibility were achieved by limiting control effectiveness or changing static stability. However, NASA research on GA stall and spin prevention has clearly shown, and flight tests have demonstrated, it is possible to maintain controllability all the way through a fully developed stall and prevent spins (Ref. NASA SP-2003-4529; Concept to Reality, CONTRIBUTIONS OF THE NASA LANGLEY RESEARCH CENTER TO U.S. CIVIL AIRCRAFT OF THE 1990s by Joseph R. Chambers, a copy of which has been included in the docket).

Maintaining controllability all the way through a fully developed stall is only possible if specific design characteristics are met to maintain pitch and roll control through the stall, and by preventing uncontrollable roll, yaw, or pitch rates from developing during stall. The result is an aircraft that will "mush" into the stall and simply descend, instead of departing controlled flight. NASA research also showed it is possible to mush into a stall and recover with minimal altitude loss. The use of an angle of attack indicator can help a pilot have situational awareness regarding pending stall, and proper recovery technique to minimize altitude loss (i.e., 300 feet or less). The NASA research also showed these features can be incorporated into existing designs, with a particular benefit from keeping outer portions of the wings from stalling. ICON Aircraft states that their research, development, and engineering effort to advance previous NASA work on the subject have made full Part 23 spin resistance possible.

The FAA disagrees with the commenters that suggest ICON should certificate the aircraft to Part 23 standards, or Primary Category standards - not to SLSA standards. The FAA has determined that the ICON A5 provides an equivalent level of safety, and may in fact exceed the level of safety provided by aircraft that meet the parameters set forth in 14 CFR § 1.1 for LSA . While the current standards and regulations do not prevent the introduction of SRA, the FAA did not specifically consider SRA in establishing the MTOW for LSA. The FAA has determined that granting relief from the MTOW for LSA for this specific safety enhancement is in the public interest and is also consistent with the FAA's goal of increasing safety for small airplanes.

The FAA disagrees with commenters who state that certain features of the ICON A5 should be removed to reduce the total amount of weight relief requested. While the interior panels of the A5 may have aesthetic value, they also improve crashworthiness by separating and protecting occupants from flight controls, cables, and other systems. The

FAA believes that these and other safety features, such as an angle of attack indicator and ballistic recovery parachute, should not be removed in order to decrease the total amount of weight relief requested to incorporate spin resistance, as their removal will decrease the level of safety provided by the aircraft.

The FAA also considered commenters' assertions that the wing fold mechanism appears to be driven by marketing instead of safety. While the wing fold mechanism may improve the marketability of the A5, the FAA determined that requiring a commensurate reduction in the aircraft's MTOW would have no appreciable positive or negative effect on level of safety afforded by this aircraft's design and would not be in the public interest.

Twelve commenters suggest that this petition, if granted, would give ICON an unfair advantage over other LSA manufacturers. Generally, the FAA does not take a position on whether a grant of exemption may provide ICON with a business advantage over its competitors. Under 14 CFR Part 11, any individual or entity may ask the FAA for relief from the requirements of a current regulation. The FAA evaluates petitions for exemption by considering the extent of relief sought, the reason for requesting relief, whether granting relief would benefit the public as a whole, and whether granting relief would not adversely affect safety or provide a level of safety at least equal to that provided by the rule from which exemption is sought. The FAA believes that granting the relief requested by the petitioner would not adversely affect safety and would be in the public interest.

Finally, from all submissions, twelve commenters stated that the current weight restrictions for LSA should be lifted for all designs so all producers of LSA could benefit from a higher weight. Such requests, however, are more appropriately the subject of petitions for rulemaking action.

In reviewing ICON Aircraft's May 9, 2013, submittal of additional information, the FAA noted that in demonstrating the model A5's spin resistance, ICON Aircraft used ASTM stall and spin resistance requirements unless no applicable ASTM requirement existed, in which case the company used 14 CFR part 23 test procedures with ASTM limits and maximum deviations where defined. However, 14 CFR § 23.221(a)(2) references the stall tests of § 23.201 and § 23.203, and in one subparagraph directly requires that, "it must be possible to maintain wings-level flight within 15 degrees of bank…" Instead, ICON substituted the ASTM maximum roll/yaw limits, which in some cases are less stringent than required by 14 CFR § 23.221(a)(2). Table 1 compares the roll/yaw limits of 14 CFR § 23.221(a)(2) with those of ASTM F2245.

Maneuver	14 CFR § 23.221(a)(2) roll/yaw limits	ASTM F2245 roll/yaw limits
Wings-Level Stall	±15° roll via direct requirement in § 23.221(a)(2)(i) AND via § 23.221(a)(2)(iii) requiring compliance with § 23.201	±20° roll or yaw
Turning Flight Stall	60° bank in original direction of turn 30° bank in opposite direction (Delta of +30°/-60°) via § 23.221(a)(2)(iii) requiring compliance with § 23.203	±60° of additional roll
Accelerated Turning Stall	90° bank in original direction of turn 60° bank in opposite direction (Delta of +60°/-90°) via § 23.221(a)(2)(iii) requiring compliance with § 23.203	±60° of additional roll

Table 1, Comparison of Part 23 and ASTM F2245 roll/yaw limits

In its petition for exemption, ICON claimed that the A5 proof of concept vehicle had, "demonstrated spin resistance in accordance with the full envelope of the 14 CFR § 23.221(a)(2) standard" and described the complex, challenging, and multivariable problem presented by designing an aircraft to meet the "full envelope of the Part 23 spin-resistance standard". ICON Aircraft's petition also included a recommended limitation that would require ICON to include the following statement on the Manufacturer's Statement of Compliance (FAA Form 8130-15): "This aircraft performs to the standard of 14 CFR § 23.221(a)(2) at amendment 23-50." ICON's petition indicates the Model A5 fully meets the spin resistance standard of 14 CFR § 23.221(a)(2). The company's petition makes no mention of substituting ASTM pass/fail criteria for the pass/fail criteria established by 14 CFR § 23.221(a)(2).

The FAA has determined that the generally more stringent roll/yaw limit pass/fail criteria of 14 CFR § 23.221(a)(2) should be applied as a condition of granting ICON's petition for exemption. The part 23 spin resistance standard requires a level of performance that will help ensure the ICON A5 provides a level of safety at least equal to that provided by the rules from which exemption is granted.

Notwithstanding ICON Aircraft's substitution of ASTM maximum roll/yaw deviations as pass/fail criteria, all test data submitted by ICON Aircraft clearly show that the A5 prototype actually met the more stringent 14 CFR § 23.221(a)(2) pass/fail criteria. The

FAA has determined that as a condition of this exemption, each production Model A5 must also meet the more stringent requirements of 14 CFR § 23.221(a)(2), without substitution of ASTM maximum roll/yaw limits. The one exception we have made to the 14 CFR § 23.221(a)(2) requirements is substitution of ASTM F2245 pilot force limits.

In establishing the definition of light-sport aircraft, the FAA sought to ensure that light-sport aircraft characteristics are consistent with the skills and training of the sport pilot and those persons authorized to perform maintenance and preventive maintenance on the aircraft. In issuing the final rule, Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft (69 FR 44772; July 27, 2004) (the LSA rule), the FAA believed that pilots operating an aircraft with an MTOW that exceeds that established by the rule should hold at least a private or recreational pilot's certificate. However, the FAA has determined that granting relief from the LSA weight limits in order to provide spin resistance and other safety features of the ICON A5 would result in the provision of an aircraft to persons exercising the privileges of a sport pilot that would provide a level of safety equivalent to that of an aircraft that, in fact, met the parameters of the LSA definition.

The FAA has determined the ICON A5's flight characteristics are appropriate for it to be operated by persons exercising the privileges of a sport pilot certificate or a student pilot seeking a sport pilot certificate. The conditions and limitations of this exemption define several design features and operating characteristics that aircraft certificated under the provisions of this exemption must meet. These conditions and limitations ensure that the ICON A5's operating characteristics are consistent with the training and skills of sport pilots. The SRA technology, angle of attack indicator, ballistic recovery parachute, and enhanced crash survival features incorporated in the ICON A5 are not required by the regulations; however, the FAA believes their inclusion in the aircraft's design will enhance GA safety and be particularly beneficial to sport pilots. As the FAA believes that these aircraft can be operated by persons exercising the privileges of a sport pilot certificate, the agency also believes that a person holding a flight instructor certificate with a sport pilot rating can provide flight training in such an aircraft even though it does not meet the parameters of the LSA definition.

ICON Aircraft stated that to ensure the spin resistance safety feature is well maintained, and to reduce maintenance errors, it is important for maintenance personnel to be trained by ICON. The petitioner recommended including a limitation requiring an ICON authorized certificate of training on repair and maintenance of the model A5. However, the FAA has determined that the existing regulations, including 14 CFR 65.81 and 65.107, sufficiently address the requirements for persons performing maintenance and preventative maintenance on light-sport aircraft. The FAA has determined that permitting maintenance and preventive maintenance to be performed on these aircraft by persons who are only authorized to perform such actions on aircraft that meet the definition of a light sport aircraft would not adversely affect safety and would be in the public interest. The additional weight and safety enhancements included as part of the design and performance of the ICON A5 do not add complexity to the maintenance or

inspection aspects of the aircraft for repairmen or sport pilots beyond that of any other aircraft issued a special airworthiness certificate in the light-sport category. Accordingly, the FAA will permit persons exercising the privileges of a sport pilot and those persons holding a repairman certificate (light sport aircraft) with a maintenance rating or inspection rating to perform maintenance and preventive maintenance on these aircraft in accordance with the privileges applicable to performing those activities on aircraft that meet the parameters of a light-sport aircraft.

Similarly, the petitioner recommended including a limitation requiring that persons operating the model A5 receive ICON authorized training. However, the FAA has determined that the existing 14 CFR requirements for operation of the aircraft are sufficient and no additional flight training requirements need to be applied as part of the grant of exemption.

ICON Aircraft recommended including a limitation requiring that each model A5 have on board an ICON Aircraft owned flight data recorder (FDR) for the purpose of continued airworthiness. However, the FAA has determined that existing requirements for maintaining continued airworthiness are sufficient and no requirement for an FDR needs to be applied as part of the grant of exemption.

The FAA recognizes that it is granting an exemption to permit an aircraft that exceeds a regulatory MTOW limitation to be certificated, operated, and maintained as if it met the applicable MTOW parameter. The FAA, however, is granting this exemption only within the limited confines of the facts presented in this petition and in accordance with the conditions and limitations set forth in this exemption. This decision should not be given wider precedential value. SLSA are not produced under type and production certification procedures and are prohibited from being used for compensation or hire except to conduct flight training or to tow a light-sport glider or an unpowered ultralight vehicle.

The FAA has denied previous petitions for relief from aircraft category weight limitations and believes that ICON's petition for relief is unique and distinguishable from these previous petitions. The purpose of ICON's petition is to allow for the incorporation of spin resistance without omitting an angle of attack indicator, ballistic recovery parachute, and enhanced crash survival features in order to achieve a level of safety commensurate with aircraft that meet the maximum weight parameter specified under the LSA rule. Spin resistance is a significant safety advancement that directly addresses the leading cause of GA fatal accidents - loss of control. From 2001 through 2011, there were over 1,300 fatal general aviation accidents involving loss-of-control in flight. The stall-spin scenario usually happens in the landing pattern at low altitude and is a major contributor to these loss-of-control accidents. A fully spin resistant airframe meeting the standards of 14 CFR part 23, §23.221(a)(2), such as that of the ICON A5, is a safety feature not substantiated in other SLSA.

ICON does not seek relief from any of the Federal Aviation Regulations that serve to limit the other design criteria of light-sport aircraft. The ICON A5 must meet the maximum level flight speed, maximum stall speed, and maximum seating capacity limits that all light-sport aircraft must meet, as well as the extensive conditions and limitations set forth in this exemption. ICON is also not seeking relief in order to incorporate safety features that have been included in designs by other manufacturers within established weight limits.

After careful consideration of the entire design and how it is intended to be operated, we find a grant of exemption is in the public interest, subject to the specific conditions and limitations contained in this exemption. The FAA bases this grant of exemption not solely on the incorporation of SRA, but on the incorporation of SRA without compromising other safe flight characteristics and safety features, such as an angle of attack indicator, a ballistic recovery parachute, and enhanced crash survival features. Some of the conditions and limitations of this grant are designed to ensure that these other safety elements, which are not required by Federal Aviation Regulations or ASTM standards, remain part of the model A5 design. No single design feature of the A5 alone would have compelled the FAA to grant ICON's request. The safety enhancements included as part of the design and performance of the ICON A5, and mandated by conditions and limitations, provide a level of safety at least equal to that provided by the rules for persons exercising the privileges of a sport pilot certificate, even with the MTOW of the aircraft above that of other aircraft issued a special airworthiness certificate in the light-sport category.

The FAA's Decision:

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator, ICON Aircraft is granted an exemption from 14 CFR §§ 21.181(a)(3) and 21.190(a) to the extent necessary to allow the ICON A5 aircraft with a MTOW of 1680 pounds to be eligible for issuance of a special airworthiness certificate in the light-sport category. ICON Aircraft is also granted an exemption from 14 CFR §§ 61.89(c), 61.303(a), and 61.315(a) on behalf of persons exercising the privileges of a sport pilot certificate or student pilots seeking a sport pilot certificate to permit those persons to operate the ICON A5 and to permit flight time obtained in the ICON A5 to be considered flight time obtained in a light-sport aircraft. ICON Aircraft is also granted an exemption from 14 CFR §§ 61.411(a), 61.415, and 61.429(b) on behalf of persons exercising the privileges of a flight instructor certificate with a sport pilot rating to permit those persons to provide flight training in the ICON A5. Additionally, ICON Aircraft is granted an exemption from 14 CFR §§ 43.3(c), 43.7(g) and 65.107(b) and (c) on behalf of holders of sport pilot certificates and repairman certificates (light-sport aircraft) with a maintenance rating or an inspection rating to permit those persons to perform maintenance and preventive maintenance on ICON A5 aircraft as authorized within those sections. All of these grants are subject to the conditions and limitations listed below. The FAA has determined that an exemption from 14 CFR §§ 61.23, 61.31, 61.305, 61.317, 61.403, 61.417, 61.419, and 61.423 is not necessary to provide the relief requested. The FAA has also determined that an exemption

from 14 CFR §§ 61.321, 61.325, and 61.327 is not necessary; however the FAA has included compliance with the provisions of those sections for certain persons as conditions and limitations of this exemption.

Conditions and Limitations

1. This exemption applies to the ICON Aircraft model number A5, serial numbers 00001 – 99999.
2. ICON may issue the manufacturer's statement of compliance required by 14 CFR § 21.190(b)(1)(iii) for its model A5 aircraft indicating a maximum takeoff weight (MTOW) of up to 1680 pounds (762 kilograms), provided the aircraft meets all applicable requirements of 14 CFR § 21.190 and the conditions and limitations specified in this exemption.
3. ICON must supply each purchaser of an ICON A5 certificated under the provisions of this exemption with a copy of the exemption. A copy of this exemption must be carried on board each aircraft during its operation.
4. The manufacturer's statement of compliance required by 14 CFR § 21.190(b)(1)(iii) must:

   (a) State that the aircraft meets the provisions of the applicable consensus standard and the design requirements specified in these conditions and limitations.
   (b) State that the aircraft meets the spin resistance standards of 14 CFR § 23.221(a)(2) without exceeding the pilot force limits of ASTM F2245 for temporary application.
   (c) State that the following safety design features have been incorporated into the aircraft:

      (1) An angle of attack (AOA) indicator that includes an indication of sensed AOA rate, allowing the pilot to identify margin above stall.
      (2) Aerodynamic characteristics and reversible flight controls that provide stall recovery capability and spin resistance without the use of a stick pusher or other automatic flight control system.
      (3) Design features that allow recovery from a wings-level, power-off stall with an altitude loss of 300 feet or less.
      (4) Aerodynamic characteristics that limit the vertical descent rate to 20 ft/s (1200 ft/min) or less during a fully developed wings-level, power-off stall.
      (5) Interior panels separating and protecting occupants from flight controls, cables, and other systems.
      (6) A ballistic recovery complete-aircraft parachute system in compliance with the latest FAA-accepted revision of ASTM International Standard F2316.
      (7) A propulsion system with a maximum power output of 100 kW (135 horsepower) or less, regardless of flight phase or de-rating of the engine.
      (8) Compliance with ASTM International Standard F2245-12c until superseded by a later FAA-accepted revision of F2245.

5. Prior to issuance of a special airworthiness certificate in the light-sport category for the first ICON A5 certificated under the provisions of this exemption, the FAA must complete an audit of ICON's facilities and find that ICON can produce the model A5 aircraft in accordance with applicable regulations, consensus standards, and the conditions and limitations set forth in this exemption.
6. Prior to issuance of a special airworthiness certificate in the light-sport category for the first ICON A5 certificated under the provisions of this exemption, the FAA must complete an inspection of the model A5 aircraft and find that the model A5 aircraft meets the provisions of all applicable regulations, consensus standards, and the conditions and limitations set forth in this exemption.
7. Any person who holds a sport pilot certificate who does not have airplane category and single-engine land and sea class privileges and seeks to obtain privileges to operate the ICON A5 aircraft must receive the logbook endorsements, successfully complete the proficiency check and complete the application specified in 14 CFR § 61.321.
8. Any person who holds a sport pilot certificate and seeks privileges to operate the ICON A5 aircraft at an airport within, or in airspace within, Class B, C, and D airspace, or in other airspace with an airport having an operational control tower must receive and log the ground and flight training and obtain the endorsement specified in 14 CFR § 61.325.
9. Any person who holds a sport pilot certificate and seeks to operate the ICON A5 aircraft must receive and log the ground and flight training and obtain the endorsement specified in 14 CFR § 61.327(b).
10. Any person who performs maintenance or preventive maintenance on the ICON model A5 aircraft under the provisions of this exemption must include a reference to this exemption in the maintenance record entry required to be made under the provisions of 14 CFR § 43.9 or 43.11, as applicable.
11. ICON must maintain a record of all failures, malfunctions, or defects of the ICON model A5 spin resistant airframe and report any failure, malfunction, or defect of the airframe and any stall or spin related accident or incident involving the model A5 to the Small Airplane Directorate within 48 hours after learning of the occurrence.

This exemption terminates on June 30, 2018, unless sooner superseded or rescinded.

Issued in Washington DC, on July 24, 2013.

/s/
Frank P. Paskiewicz
Deputy Director, Aircraft Certification
Service