



FLIGHT DESIGN

Stalling Speeds Flight Design CTSW-2006 LSA (USA)

Stalling Speeds for Flight Design aircraft delivered in 2006 have been determined in compliance with ASTM F2245-04. Flight test was conducted to determine the stalling speeds in CAS, using the GPS method, with the following result:

Flaps -6°

GPS readings, up wind, knots	34	34	32	34
GPS readings, down wind, knots	51	57	55	52
KTAS	42,5	45,5	43,5	42

Average V_{S1} is 43.3KTAS, or 43.9KCAS

Flaps 0°

GPS readings, up wind, knots	33	34	31	34
GPS readings, down wind, knots	51	50	52	51
KTAS	42	42	41,5	42,5

Average V_{S1} is 42.0KTAS, or 42.4KCAS

Flaps 15°

GPS readings, up wind, knots	32	33	29	30
GPS readings, down wind, knots	50	51	53	51
KTAS	41	42	41	40,5

Average V_{S1} is 41.1KTAS, or 41.4KCAS

Flaps 30°

GPS readings, up wind, knots	29	28	30	27
GPS readings, down wind, knots	49	47	52	50
KTAS	39	37,5	41	38,5

Average V_{S1} is 39.0KTAS, or 39.4KCAS

Flaps 40°

GPS readings, up wind, knots	29	27	30	26
GPS readings, down wind, knots	50	47	48	48
KTAS	39,5	37	39	37

Average V_{S1} is 38.1KTAS, or 38.5KCAS

Flight Design GmbH

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The obtained values are quoted in the relevant Aircraft Operating Instruction (AOI):

4 Operating Limitations

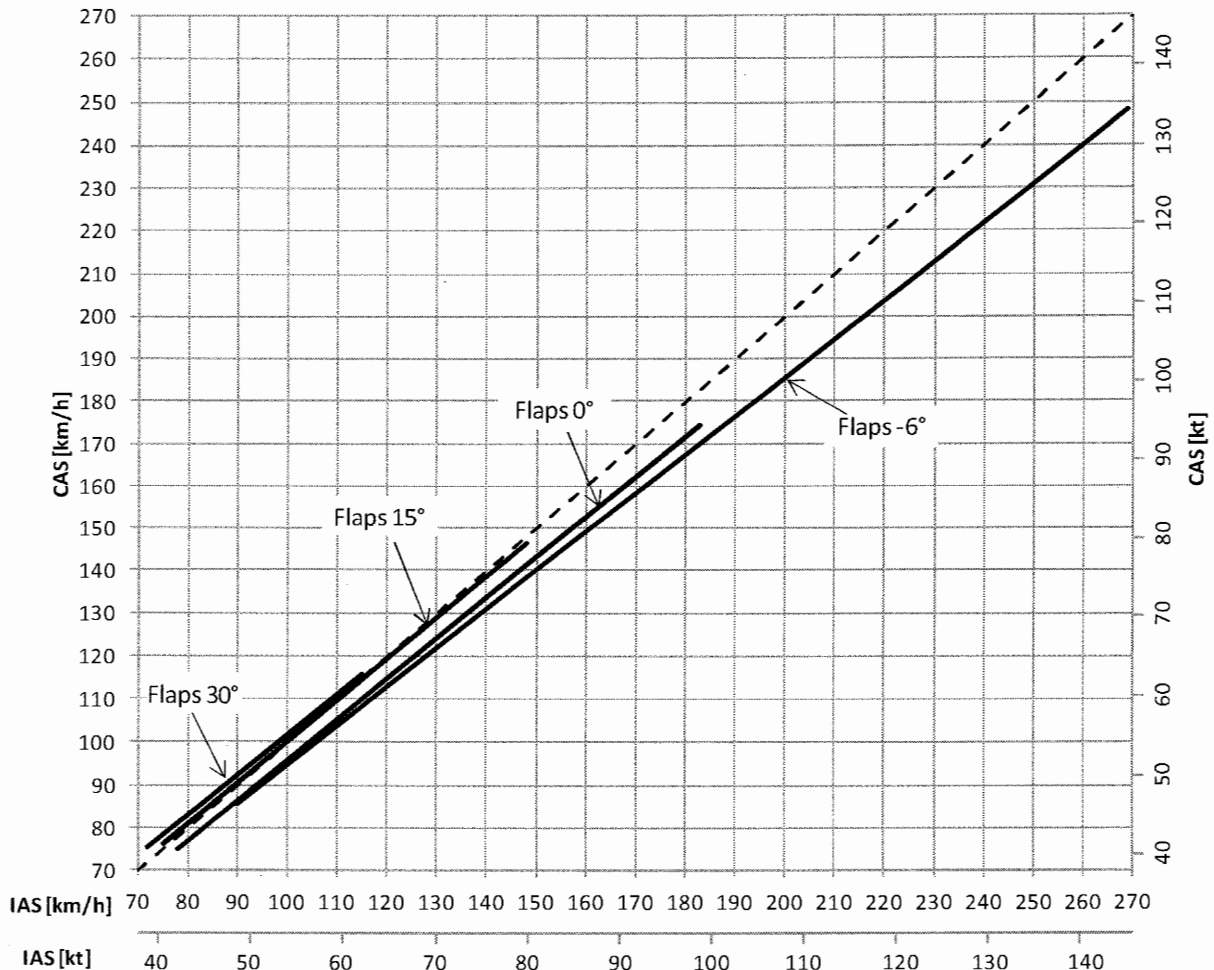
4.1 Stalling speeds at maximum takeoff weight (V_{S1} and V_{S0})

V_{S0} : Stalling speed or the minimum steady flight speed in the landing configuration.

V_{S1} : Stalling speed or the minimum steady flight speed obtained in a specific configuration.

V_S	Flaps -6° (-12°)	44 KCAS (49 KCAS)	81 km/h CAS (90 km/h CAS)
V_{S1}	Flaps 0°	42 KCAS	77 km/h CAS
V_{S0}	Flaps 40°	39 KCAS	72 km/h CAS

At this time, ASTM standards with applicability to LSA airplanes did mandate all airspeeds to be provided as calibrated airspeed within the manuals. Detailed calibration curves have been tested using the subsequent model of the aircraft. At this point in time the requirements for the Pilot's Operating Handbook became active, requiring airspeeds provided from there on as IAS, and therefore also requiring to show airspeed calibration curves. The pitot-static system between the two aircraft is identical, the calibration curves are valid as well for CTSW.



FAA accepted requirements for LSA aircraft (F2245-04 at this time) do not require to determination or to provide stall speeds under bank angles, or stall speeds at aircraft mass other than MTOW. Therefore no dedicated data is provided for CTSW. The values can be easily determined using the un-accelerated level stalling speeds as basis:

Stalling speed scales with the square-root of the wing loading. So:

- For different takeoff weights this translates to the aircraft weight;
- For different bank angles this translates to the g load under this bank angle.

With this, the stalling speeds determined above translate as follows:

Stalling speeds CTSW-2006 LSA (USA) @ level flight and different takeoff weight (calculated)

	<i>MTOW</i>	<i>550 kg</i>	<i>500 kg</i>	<i>450 kg</i>	<i>400 kg</i>
<i>mass ratio to MTOW [-]</i>	1,00	0,92	0,83	0,75	0,67
<i>speed ratio (mass ratio ^ 0.5)</i>	1,00	0,96	0,91	0,87	0,82
<i>Stalling speed -6° flaps [KCAS]</i>	44	42	40	38	36
<i>Stalling speed 0° flaps [KCAS]</i>	42	40	38	36	34
<i>Stalling speed 15° flaps [KCAS]</i>	41	39	37	36	33
<i>Stalling speed 30° flaps [KCAS]</i>	39	37	36	34	32
<i>Stalling speed 40° flaps [KCAS]</i>	39	37	36	34	32

Stalling speeds CTSW-2006 LSA (USA) @ MTOW = 600 kg and different bank angles (calculated)

	<i>level flight</i>	<i>15° bank</i>	<i>30° bank</i>	<i>45° bank</i>	<i>60° bank</i>
<i>g-load [-]</i>	1,00	1,04	1,15	1,41	2,00
<i>equivalent mass [kg]</i>	600	621	693	849	1200
<i>speed ratio (g-load ^ 0.5)</i>	1,00	1,02	1,07	1,19	1,41
<i>Stalling speed -6° flaps [KCAS]</i>	44	45	47	52	62
<i>Stalling speed 0° flaps [KCAS]</i>	42	43	45	50	59
<i>Stalling speed 15° flaps [KCAS]</i>	41	42	44	49	58
<i>Stalling speed 30° flaps [KCAS]</i>	39	40	42	46	55
<i>Stalling speed 40° flaps [KCAS]</i>	39	40	42	46	55

Kamenz, 23. November 2014



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