

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

G04CE
Revision 3
Schempp-Hirth Flugzeugbau GmbH
Ventus-2a
Ventus-2b

November 23, 2005

TYPE CERTIFICATE DATA SHEET No. G04CE

This data sheet, which is part of Type Certificate No. G04CE prescribes conditions and limitations under which the product for which the Type Certificate was issued meets the airworthiness requirements of the Federal Aviation Regulations.

Type Certificate Holder: Schempp-Hirth Flugzeugbau GmbH
Krebenstrasse 25
D-73230 Kichheim/Teck
Germany

I. Model "Ventus-2a", Glider (Utility) Category, approved January 30, 1997

Airspeed Limits (IAS):

V _{NE} Speed Limit versus Altitude	[knots]	[mph]	[km/h]
0 - 2000 m (0 - 6562 ft)	146	168	270
3000 m (9843 ft)	140	162	260
4000 m (13123 ft)	133	153	247
5000 m (16404 ft)	126	145	234
6000 m (19685 ft)	119	137	221
7000 m (22966 ft)	113	130	209
8000 m (26247 ft)	106	122	197
9000 m (29528 ft)	100	116	186
10000 m (32808 ft)	94	109	175
11000 m (36089 ft)	88	101	163
12000 m (39370 ft)	82	94	151

	[knots]	[mph]	[km/h]
V _{RA} (Rough Air Speed)	97	112	180
V _A (Maneuvering Speed)	97	112	180
V _{AIRBRAKES}	146	168	270
V _T (Aerotow)	97	112	180
V _W (Winch Launch)	81	93	150
V _{LO} (U/C Operation)	97	112	180
V _{FE} (Flap Extension)			
With Flaps At: -1, -2, S, S1:	146	168	270
With Flaps At: 0, +1, +2, L:	86	99	160

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C.G. Range: Forward C.G.: 8.66 in. (220 mm) aft of datum
Aft C.G.: 14.17 in. (360 mm) aft of datum

Empty Weight C.G.: See Flight Manual. (Record of Weight and Balance)

Datum: Wing leading edge at wing root rib

Leveling Means: Upper edge of a wedge 100:3.125 to be horizontal when placed on rear top of fuselage.

Maximum Weight: Takeoff : 1157 lbs (525 kg)
Landing: 1157 lbs (525 kg)

No. of Seats: One;
S/N 2 through 120 (original tail units) and S/N 124 and subsequent (modified tail units): 17.91 inches (455 mm) ahead of datum

Maximum Baggage: An enclosed baggage compartment is not provided.

Water Capacity: Both wing tanks: 52.84 U.S. Gallons (200 Liters)
Fin tank (optional): 1.72 U.S. Gallons (6.5 Liters)

For Serial Number Aircraft 124 and subsequent:
Fin tank (optional): 2.06 U.S. Gallons (7.8 Liters)

Control Surface Movements.

For Serial Number Aircraft 1 through 123:

Aileron:

Up: 1.30 ± 0.12 in. (33 ± 3 mm)
Down: 0.98 ± 0.12 in. (25 ± 3 mm)
Measured 4.96 in. (126 mm) from hinge axis

Wing flaps:

Set at "S1" (up): 1.18 ± 0.08 in (30 ± 2 mm)
Set at "0" (neutral): 0 ± 0.08 in (0 ± 2 mm)
Set at "L" (down): 0.87 ± 0.08 in. (22 ± 2 mm)
Measured 4.96 in. (126 mm) from hinge axis

Elevator:

Up: 2.01 ± .08 in. (51 ± 2 mm)
Down: 1.85 ± .16 in. (47 ± 4 mm)
Measured 6.18 in. (157 mm) from hinge axis

Rudder:

To either side: 6.30 ± 0.79 in. (160 ± 20 mm)
Measured 13.39 in. (340 mm) from hinge axis.

Control Surface Movements.

For Serial Number Aircraft 124 and subsequent:

Aileron:

Up: 1.30 ± 0.12 in. (33 ± 3 mm)
Down: 0.98 ± 0.12 in. (25 ± 3 mm)
Measured 4.96 in. (126 mm) from hinge axis

Wing flaps:

Set at "S1" (up): 1.18 ± 0.08 in (30 ± 2 mm)
Set at "0" (neutral): 0 ± 0.08 in (0 ± 2 mm)
Set at "L" (down): 0.87 ± 0.08 in. (22 ± 2 mm)
Measured 4.96 in. (126 mm) from hinge axis

Control Surface Movements cont'd.

Elevator:

Up: 1.73 + 0.12 in., -0.08 in (44 + 3, -2 mm)

Down: 1.73 + 0.12 in., -0.08 in (44 + 3, -2 mm)

Measured 5.43 in. (138 mm) from hinge axis

Rudder:

To either side: 6.10 ± 0.59 in. (155 ± 15 mm)

Measured 12.72 in. (323 mm) from hinge axis.

Weak link for towing: 1157 to 1499 lbs. (525 to 680 daN)**II. Model "Ventus-2b", Glider (Utility) Category, approved January 30, 1997**Airspeed Limits (IAS):

V _{NE} Speed Limit versus Altitude	[knots]	[mph]	[km/h]
0 - 2000 m (0 - 6562 ft)	146	168	270
3000 m (9843 ft)	140	162	260
4000 m (13123 ft)	133	153	247
5000 m (16404 ft)	126	145	234
6000 m (19685 ft)	119	137	221
7000 m (22966 ft)	113	130	209
8000 m (26247 ft)	106	122	197
9000 m (29528 ft)	100	116	186
10000 m (32808 ft)	94	109	175
11000 m (36089 ft)	88	101	163
12000 m (39370 ft)	82	94	151

	[knots]	[mph]	[km/h]
V _{RA} (Rough Air Speed)	97	112	180
V _A (Maneuvering Speed)	97	112	180
V _{AIRBRAKES}	146	168	270
V _T (Aerotow)	97	112	180
V _W (Winch Launch)	81	93	150
V _{LO} (U/C Operation)	97	112	180
V _{FE} (Flap Extension)			
With Flaps At: -1, -2, S, S1:	146	168	270
With Flaps At: 0, +1, +2, L:	86	99	160

C.G. Range:

Forward C.G.: 8.66 in. (220 mm) aft of datum

Aft C.G.: 14.17 in. (360 mm) aft of datum

Empty Weight C.G.:

See Flight Manual. (Record of Weight and Balance)

Datum:

Wing leading edge at wing root rib

Leveling Means:

Upper edge of a wedge 100:4.4 to be horizontal when placed on rear top of fuselage.

Maximum Weight: Takeoff: 1157 lbs (525 kg)
Landing: 1157 lbs (525 kg)

No. of Seats: One;
Serial number aircraft 3 through 123 (original tail units): 20.39 inches (518 mm) ahead of datum.
Serial number aircraft 127 and subsequent (modified tail units): 20.87 inches (530 mm) ahead of datum.

Maximum Baggage: An enclosed baggage compartment is not provided.

Water Capacity.: Both wing tanks: 52.84 U.S. Gallons (200 Liters)
Fin tank (optional): 1.72 U.S. Gallons (6.5 Liters)

For Serial Number Aircraft 127 and subsequent:
Fin tank (optional): 2.06 U.S. Gallons (7.8 Liters)

Control Surface Movements.

For Serial Number Aircraft 3 through 123:

Aileron:

Up: 1.30 ± 0.12 in. (33 ± 3 mm)
Down: 0.98 ± 0.12 in. (25 ± 3 mm)
Measured 4.96 in. (126 mm) from hinge axis

Wing flaps:

Set at "S1" (up): 1.18 ± 0.08 in (30 ± 2 mm)
Set at "0" (neutral): 0 ± 0.08 in (0 ± 2 mm)
Set at "L" (down): 0.87 ± 0.08 in. (22 ± 2 mm)
Measured 4.96 in. (126 mm) from hinge axis

Elevator:

Up: $2.01 \pm .08$ in. (51 ± 2 mm)
Down: $1.85 \pm .16$ in. (47 ± 4 mm)
Measured: 6.18 in. (157 mm) from hinge axis

Rudder:

To either side: 6.30 ± 0.79 in. (160 ± 20 mm)
Measured 13.39 in. (340 mm) from hinge axis.

Control Surface Movements.

For Serial Number Aircraft 127 and subsequent:

Aileron:

Up: 1.30 ± 0.12 in. (33 ± 3 mm)
Down: 0.98 ± 0.12 in. (25 ± 3 mm)
Measured 4.96 in. (126 mm) from hinge axis

Wing flaps:

Set at "S1" (up): 1.18 ± 0.08 in (30 ± 2 mm)
Set at "0" (neutral): 0 ± 0.08 in (0 ± 2 mm)
Set at "L" (down): 0.87 ± 0.08 in. (22 ± 2 mm)
Measured 4.96 in. (126 mm) from hinge axis

Elevator:

Up: $1.73 + 0.12$ in., -0.08 in ($44 + 3$, -2 mm)
Down: $1.73 + 0.12$ in., -0.08 in ($44 + 3$, -2 mm)
Measured 5.43 in. (138 mm) from hinge axis

Control Surface Movements, cont'd.

Rudder:

To either side: 6.10 ± 0.59 in. (155 ± 15 mm)
Measured 12.72 in. (323 mm) from hinge axis.

Weak link for towing: 1157 to 1499 lbs. (525 to 680 daN)

Serial Nos. Eligible: See Import Requirements.

Certification Basis: For the Ventus-2a and Ventus-2b:

The regulations (unless otherwise stated) are Title 14 of the Code of Federal Regulations (14CFR):

- 1) 14 CFR 21.23, 21.29 and 21.50 effective February 1, 1965 including Amendment 21-1 through 21-71.
- 2) JAR22 Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes Change 4 dated May 7, 1987, as Amended by Orange Papers (OP) OP22/90/1, OP22/91/1, OP22/92/1, and OP 22/94/1. Exception is noted to JAR 22.49(b)(2), which is amended per OP22/91/1.
- 3) A. Draft NPA 22 D-46 dated April 7, 1994 relating to JAR 22.785(e)(f), Seat and Restraint System.
B. Draft NPA 22 D-64 dated April 12, 1994 relating to JAR 22.788, Head Rests.
C. For Ventus-2a, Serial Number 124 and Subsequent:
Draft NPA 22 D-64 dated February 5, 1998 relating to JAR 22.788, Head Rests.
D. For Ventus-2b, Serial Number 127 and Subsequent:
Draft NPA 22 D-64 dated February 5, 1998 relating to JAR 22.788, Head Rests.
- 4) LBA Standards for Structural Substantiation of Sailplanes and Powered Sailplane Components Consisting of Glass or Carbon Fibre Reinforced Plastics, dated July 1991.
- 5) LBA Reference I4-I 413/89 dated October 25, 1989: additional requirements for the installation of a water ballast system into the fin (for compensating the nose-heavy moment of water ballast in wing tanks).
- 6) Exemption No. 4988 to 14 CFR 45, effective April 20, 1964, Amendments 45-1 through 45-16, Section 45.11(a) and (d) (External Identification Plate), pursuant to 14 CFR 11, Effective November 10, 1962, Amendments 11-1 through 11-36, Section 11.15, 11.25, and 11.27.
- 7) 14 CFR 91, Effective September 30, 1963, Amendments 91-1 through 91-229, Section 91.205 (VFR/IFR Equipment requirements).
- 8) Special compliance established on the basis of an equivalent level of safety for JAR 22.207(c), stall warning beginning speed range.
- 9) Type Certificate No. G04CE issued January 30, 1997 and amended to Revision 2, dated October 4, 2004.
- 10) Date of Application for Type Certificate: September 6, 1995.

Certification Basis, cont'd.

- 11) Luftfahrt Bundesamt (LBA) German CAA issued Type Certificate 349 dated January 26, 1996. For the Ventus-2a, this certificate has been updated to Issue 3 dated November 26, 2002. For the Ventus-2b, the certificate has been updated to Issue 3 dated February 19, 2003.

Import Requirements:

A U.S. Standard Airworthiness Certificate may be issued on the basis of a Certificate of Airworthiness for Export signed by a representative of the LBA containing the following statement:

"The glider covered by this certificate has been examined, tested and found to conform to the type design approved under FAA Type Certificate G04CE and is in condition for safe operation."

Prematurely imported VENTUS -2a sailplane serial numbers 10, 125, 126, 130, 137, and 153 are eligible for a U.S. Standard Airworthiness Certificate if Schempp-Hirth Flugzeugbau GmbH Technical Note No. 349-19 dated July 13, 2004 has been complied with and if all import requirements of this TCDS are satisfied.

Prematurely imported VENTUS -2b sailplanes serial numbers 09, 14, 16, 22, 31, 127, 131, 133, 135, 140, 148, 150, 152, and 159 are eligible for a U.S. Standard Airworthiness Certificate if Schempp-Hirth Flugzeugbau GmbH Technical Note No. 349-19 dated July 13, 2004 has been complied with and if all import requirements of this TCDS are satisfied.

Modifications pre-dating the issuance of this Type Certificate and not specified in any of the above paragraphs of this note, and modifications dated after the issuance of this Type Certificate which are not covered by information contained in the Service Information paragraph of this Type Certificate must be assumed not to be approved under this Type Certificate.

The U.S. airworthiness certification basis for aircraft type certificated under 14 CFR 21 section 21.29 and exported by the country of manufacture is section 21.183(c).

Equipment:

The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the glider for certification. In addition, the following items of equipment are required:

For the Ventus-2a and Ventus-2b:

1. Basic equipment and instruments:

Day VFR:

- a) Airspeed indicator (knots)
- b) Altimeter (feet and pressure scale in inches of Hg)
- c) Outside air temperature indicator (when flying with water ballast)
- d) Four-piece safety harness
- e) Automatic or manual parachute or
- f) Back cushion (thickness approximately 3.94 in. / 10 cm when compressed)

Cloud flying (day):

- e) Magnetic compass
- f) Variometer
- g) Turn and bank indicator with slip ball

2. LBA-approved Flight Manual for sailplane models "Ventus-2a" and "Ventus-2b" issued August 1995 and LBA approved January 30, 1997, or latest approved revision.

Service Information: Service bulletins, structural repair manuals, vendor manuals, flight manuals, and overhaul and maintenance manuals which contain a statement that the documents are approved by the exporting airworthiness authority (LBA) are accepted by the FAA and are considered FAA approved. These approvals pertain to the type design only.

Available Documents for the Schempp-Hirth Flugzeugbau GmbH model Ventus-2A and Ventus-2B series:

- Instruction for Continued Airworthiness (Maintenance Manual) for Ventus-2A and Ventus-2B issued on August 1995, or later approved revision.
- Repair instructions for sailplane models “Ventus-2a” and “Ventus-2b” issued August 1995 or later approved revision.
- Operating instructions for the Tost nose tow release mechanism model “E 85” (if installed), issued March 1989 or later LBA-approved revision.
- Operating instructions for the Tost safety tow release mechanism model “Europa G 88” (if installed), issued February 1989 or later LBA-approved revision.

NOTES:

NOTE 1 Current weight and balance data including a list of equipment included in the certificated empty weight, and loading instructions, when necessary, must be provided for each glider at the time of original certification, and at all times thereafter.

NOTE 2 The placards listed in the flight manual must be displayed. A complete listing of placards is in the Instructions for Continued Airworthiness Manual (Maintenance Manual).

The following placards must be displayed in clear view of the pilot:

"THE MARKINGS AND PLACARDS INSTALLED IN THIS GLIDER CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS GLIDER IN THE UTILITY CATEGORY. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS GLIDER IN THIS CATEGORY ARE CONTAINED IN THE GLIDER FLIGHT MANUAL."

“Night flying is prohibited”

“Aerotow permitted from the forward hook only”

For models with the original tail unit installed:

“Aerobatic: the following maneuvers and associated entry speeds are permitted:

1. Inside Loops; 200 km/h (108 kt, 124 mph)
2. Stalled Turns; Between 190 and 200 km/h (103-108 kt, 118-124 mph)
3. Lazy Eight; Between 190 and 200 km/h, (103-108 kt, 118-124 mph)”

For models with the new tail unit installed:

“Aerobatic: the following maneuvers and associated entry speeds are permitted:

1. Inside Loops; 180 km/h (97 kt, 112 mph)
2. Stalled Turns; 200 km/h (108 kt, 124 mph)
3. Lazy Eight; 160 km/h (86 kt, 99 mph)”

The “Vne vs Altitude” placard must be located near the Airspeed indicator.

NOTE 3 Airworthiness Limitations are specified in the LIMITATION section of the Flight Manual and the Instructions for Continued Airworthiness (Maintenance Manual), issued August 1995, including revision No. 2, dated January 1997 are FAA-approved. These LIMITATIONS specify mandatory replacement times, and operating limitations and may not be changed without FAA approval.

The inspections, maintenance, repair and painting must be accomplished according to the Maintenance Manual. Major structural repairs must be accomplished at FAA certificated repair stations rated for composite aircraft structure work, and may only be accomplished in accordance with the manufacturer's repair methods and approved by the CAA if not covered by the repair manual.

NOTES, cont'd

- NOTE 4 Aerobatics are only permissible without water ballast. See the Flight Manual for maneuver instructions.
- NOTE 5 All external portions of the glider exposed to sunlight must be painted white except the surfaces for registration and anti-collision markings.
- NOTE 6 Major structural repairs must be accomplished at FAA certificated repair stations rated for composite aircraft structure work, in accordance with Schempp-Hirth Flugzeugbau GmbH repair methods approved by FAA.
- NOTE 7 Information essential for the proper operation, maintenance, and inspection of the glider is contained in the Model Ventus-2a/Ventus-2b Flight Manual and Maintenance Manual.
- NOTE 8 The use of the new tail unit and Maughmer winglets is permissible according to the LBA-approved Modification Bulletin No. 349-42, LBA approved November 26, 2002. Ventus-2a serial numbers 2 through 120 are eligible for the new tail unit and winglets according to Schempp-Hirth Technical Note No. 349-27, LBA approved February 04, 2003. For the Ventus-2a, these items are standard from serial number 124 and subsequent. For the Ventus-2b, these items are standard from serial number 127 and subsequent.

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