

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

G22CE
Revision 0
Schempp-Hirth Flugzeugbau GmbH
Discus 2cT
January 22, 2009

TYPE CERTIFICATE DATA SHEET NO. G22CE

This data sheet, which is part of Type Certificate No. G22CE 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 Kirchheim/Teck
Germany

I. Model "Discus 2cT" Glider, Utility Category (Non-Self Launching), approved January 30, 2008

Description: The Discus-2cT is a single-seat, high performance sailplane constructed from CFRP, GFRP, and AFRP in a T-tail configuration. It is equipped with a retractable two-stroke Solo model 2350 engine and fixed pitch, multi-blade propeller. It does not have self-launching capability, nor does the engine have the ability for throttle control. It can be flown in 15m or 18m configurations. It is certificated under JAR 22 by the European Aviation Safety Agency (EASA) to operate in the Utility category under EASA TCDS number A.050, Issue 1, dated September 16, 2005

Engine: (1) Solo 2350
German Type Certificate Data Sheet No. 4603, Issue 5, dated December 18, 2001;
Engine modified in compliance with LBA-approved Technical Note 4603-1 and 4603-3 by Messrs. Solo Kleinmotoren GmbH.

Fuel: Two-stroke mixture, unleaded automotive gasoline
Min. RON 95 or AVGAS 100 LL

Oil (lubrication) Fuel/oil mixture, mixing proportion for "CASTROL Super TT": 40:1

Engine Limits: Take off power: 20.52 HP (15.3 kW) at 5500 rpm
Max. Continuous Power at MSL: 20.52 HP (22 kW) at 5500 rpm
Max. RPM: 5800 rpm
Max. Cylinder Head Temperature: 446° F (230° C)

Propeller Technoflug Leichtflugzeugbau GmbH
Model: OE-FL 5.83/83a5, v92
LBA Data Sheet No. OE-FL/8
Diameter: 32.68 in (830 mm) +/- 0 in (0 mm)
No further diameter reduction permitted
Reduction ratio: 1:1
Propeller features blades of different length ($d_{min}/d = 92\%$) and a modified propeller hub according to LBA-approved Technical Note 4603-2 by Messrs. SOLO Kleinmotoren GmbH

Page No.	1	2	3	4	5	6	7
Rev. No.	-	-	-	-	-	-	-

Airspeed Limits (IAS):

V _{NE} Speed Limit versus Altitude	[knots]	[mph]	[km/h]
0 - 2000 m (6560 ft)	151	174	280
3000 m (9840 ft)	143	166	267
4000 m (13120 ft)	136	157	253
5000 m (16400 ft)	130	149	240
6000 m (19680 ft)	122	141	227
7000 m (22960 ft)	115	134	215
8000 m (26240 ft)	109	126	203
9000 m (29520 ft)	102	119	191
10000 m (32800 ft)	97	112	180

Airspeed Limits (IAS) cont'd:

	[knots]	[mph]	[km/h]
V _{RA} (Rough Air Speed)	103	118	190
V _A (Maneuvering Speed)	103	118	190
V _T (Aerotow)	97	112	180
V _W (Winch Launch)	81	93	150
V _{LO} (Landing Gear Operating Speed)	97	112	180
V _{MAX1} (Max Speed w/ Power Plant Extended and Ignition ON)	81	93	150
V _{MAX2} (Max Speed w/ Power Plant Extended and Ignition OFF)	97	112	180
V _{PO_{MAX}} (Max. Power Plant Ext/Ret Speed)	65	75	120
V _{PO_{MIN}} (Min. Power Plant Ext/Ret Speed)	49	56	90

C.G. Range

Max. Forward C.G position: 11.02 in. (280 mm) aft of datum
 Max. Aft C.G position: 16.54 in. (420 mm) aft of datum

Datum

Wing leading edge at wing root rib

Leveling Means

Tail jacked up such that the upper edge of a wedge with slope 1000:44 is horizontal when placed on rear top of fuselage.

Maximum Weights

Wing Span	15m	18m
Max take-off weight incl. water ballast	1157 lb (525 kg)	1246 lb (565 kg)
Max landing weight	1157 lb (525 kg)	1246 lb (565 kg)
Max weight of non-lifting parts	671 lbs (305 kg)	671 lbs (305 kg)

Max. permitted take off and landing weight

without waterballast: $m_{NT} + m_{FL}$

where: m_{FL} = current weight of wing panel

m_{NT} = max permitted weight of all non-lifting parts = 671 lb (305 kg)

Maximum Baggage Weight

4.4 lb (2 kg)

Note: An enclosed baggage compartment is not provided; however, the baggage must be taken into account when determining the permissible load on the seat.

Minimum Crew

One (pilot)

No. of Seats

One

Moment arm 19.69 in (500 mm) forward of datum

Fuel Capacity

3.57 U.S. Gallons (13.5 Liters)

Usable: 3.43 U.S. Gallons (13.0 Liters)

Non-useable fuel: 0.14 U.S. Gallons (0.5 Liters)

Moment arm: 14.37 in (365 mm) aft of datum

Water Capacity

Each wing tank: 26.42 U.S. Gallons (100 Liters)

Moment arm: 8.15 in (207 mm) aft of datum

Fin tank (optional): 2.11 U.S. Gallons (8 Liters)

Moment arm: 169.49 in (4305 mm) aft of datum

Control Surface Movements

Aileron:

Up 2.48 ± 0.12 in. (63 ± 3 mm)

Down 1.18 ± 0.12 in. (30 ± 3 mm)

Measured 5.98 in. (152 mm) from hinge axis

Elevator:

Up or Down: 1.73 in. + 0.12 in. (44 mm + 3 mm)

- 0.08 in. (-2 mm)

Measured 5.55 in. (141 mm) from hinge axis

Rudder:

To either side: 6.30 ± 0.79 in. (160 mm \pm 20 mm)

Measured 12.99 in. (330 mm) from hinge axis.

Weak Link for Towing

Ultimate strength:

For aero tow and winch launching: max 1620 lb (735 daN)

Tow Release:

Nose hook: Tost E 85, LBA TCDS No. 60.230/1

C.G. tow release: Europa G 88, LBA TCDS No. 60.230/2

Note: Installation of the nose hook or C.G. tow release hook is optional, depending on intended use.

<u>Battery:</u>	Engine Compartment: 12V / 16-18 Ah Avionic Compartment: One or two batteries, 12V / 7-7.2 Ah Fin Compartment: 12V / 7-7.2 Ah See Flight Manual for additional information
<u>Serial Nos. Eligible</u>	See Import Requirements
<u>Certification Basis</u>	<p>The regulations (unless otherwise stated) are Title 14 of the Code of Federal Regulations (14CFR):</p> <ol style="list-style-type: none">1) FAR Part 21 effective February 1, 1965 including Amendment 21-1 through 21-91;2) JAR 22: Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes, effective June 27, 1989 (Change 4 of the English original issue, including Amendment 22/90/1.)3) JAR 22.785(e)(f), Seat and Restraint System, Change 6, dated 26 September, 2000.4) JAR 22.788, Head Rests, Change 6, dated 26 September, 20005) FAA Equivalent Level of Safety number ACE-08-17 to JAR 22.207, Change 4: Stall Warning, Paragraphs (a) (for power plant extended with ignition off); and Paragraph (c).6) FAA Equivalent Level of Safety number ACE-08-18 to JAR 22.1093, Change 4: Induction System Icing Protection.7) LBA Standards for Structural Substantiation of Sailplanes and Powered Sailplane Parts Consisting of Glass or Carbon Fibre Reinforced Plastics, issued July 1991.8) LBA Document I 334 – MS 92: Guidelines Concerning Proof of Compliance for the Electrical System of Powered Sailplanes, dated September 15, 19929) NPA 22A, B, G-18 concerning powered sailplanes not capable of self-launching, dated April 1990.10) Additional requirements for the installation of a water ballast system into the fin (for compensating the nose-heavy moment due to seat loading and water ballast in wing tanks). LBA Reference: I4 – I 413/89 dated October 25, 1989.11) Date of Application for FAA Type Certificate: April 25, 2007.12) Schempp-Hirth statement dated September 26, 2008, which confirms serial numbers 31 through 35 have been modified during production according to Schempp-Hirth Technical Note 863-13, Action 2.

Certification Basis, cont'd:

13) EASA Type Certificate No. EASA.A.050, Issue 1, dated September 16, 2005*

* The European Aviation Safety Agency originally type certificated this aircraft under its Type Certificate Number "EASA.A.050". The FAA validated this product under U.S Type Certificate Number G22CE. Effective September 28, 2003, EASA began oversight of this product on behalf of Germany, the State of Design.

Import Requirements

The FAA can issue a U.S. airworthiness certificate based on the German civil airworthiness authority (Luftfahrt-Bundesamt, LBA) Export Certificate of Airworthiness (C of A) signed by a representative of the LBA on behalf of the European Community. The Export C of A should contain the following statement: "The aircraft covered by this certificate has been examined, tested, and found to conform to the type design approved under FAA Type Certificate G22CE and to be in a condition for safe operation."

The following serial numbers are eligible for a U.S. Standard Airworthiness Certificate if all requirements of this datasheet are satisfied:

Prematurely exported serial numbers 19, 23, 25, 38, 52, and 58 are eligible based on the Luftfahrt Bundesamt statement dated October 21, 2008, that these gliders are covered by EASA TCDS No. A.050 and the examination, testing, and conformity of these gliders meet the requirements of FAA TCDS No. G22CE and at the time of export, were in a condition for safe operation.

Serial numbers 1 through 30 and 36 and subsequent are eligible when the glider has been modified in accordance with Schempp-Hirth Technical Note TN 863-14. Serial numbers 31 through 35 are eligible when the glider has been modified in accordance with Schempp-Hirth Technical Note TN 863-13**. In addition, Schempp-Hirth Technical Note TN 863-19 must be incorporated into serial numbers 35 through 74 prior to issuance of an airworthiness certificate. Also, Revision 5 of the Flight Manual must be incorporated for all serial numbers.

** See Certification Basis, Item 12.

Equipment

Minimum equipment and instruments:

Day VFR:

- (1) Airspeed Indicator with range up to 162 kts (186 mph, 300 km/h)
- (1) Altimeter
- (1) Magnetic Compass
- (1) Engine Control Unit featuring
 - RPM indicator
 - Engine hour meter
- (1) Fuel Quantity Indicator
- (1) Rear View Mirror
- (1) Four-point Safety Harness (symmetrical)
- (1) Outside Air Temperature (OAT) Indicator with Sensor (when flying with water ballast, red line at 35.6 °F (2 °C))

Caution: The sensor for the OAT must be installed in the ventilation air intake. For structural reasons, the weight (mass) of the instrument panel with instruments in place must not exceed 22 lb (10 kg).

Equipment, cont'd:

- (1) Automatic or Manual Parachute or Back Cushion (thickness approx. 3.94 in (10 cm) when compressed), when flying without a parachute
- (1) LBA-approved Flight Manual for Discus-2cT, date of issued January 2005 and approved July 21, 2005 with applicable revision updates, including Revision 5 dated September 2008.

For cloud flying, the following additional equipment is required:

- (1) Turn and bank indicator with slip ball
- (1) Variometer
- (1) Magnetic Compass

Service Information

Each of the documents listed below must state that it is approved by the European Aviation Safety Agency (EASA) or – for approvals made before September 28, 2003 – by the German Airworthiness Authority (LBA). Any such documents are accepted by the FAA and are considered FAA approved.

- Aircraft Flight Manual
- Aircraft Maintenance Manual
- Repair Instructions
- Technical Notes
- Airworthiness Limitations

Available Documents for the Schempp-Hirth Flugzeugbau GmbH model Discus-2cT:

1. Flight Manual for powered sailplane model Discus-2cT, issued January 2005, LBA original approval date July 21, 2005 with applicable revision updates. Revision 5 must be incorporated.
2. Maintenance Manual for the Powered Sailplane Discus-2cT, issued January 2005 with applicable revision updates.
3. Repair Instructions for the Discus-2cT, issued January 2005.
4. LBA-approved Engine Manual for the SOLO Engine type 2350, the latest applicable issue, by Messrs. SOLO Kleinmotoren GmbH
5. LBA-approved Manual for the folding propeller type OE-FL ./83, the latest applicable issue, by Messrs. Ingrid Oehler TB GmbH
6. Repair Manual for the folding propeller, type “OE-FL ./83, latest applicable issue by Messrs. Ingrid Oehler TB GmbH
7. Operating Instructions for the Tost Model “E 85” nose tow release mechanism, latest approved version (if installed)
8. Operating Instructions for the Tost Model “Europa G 88” safety tow release mechanism, latest approved version (if installed)
9. Diluter demand oxygen system (optional)
 - I. Operating Instructions No. 1/601 for DRÄGER regulator model “HLA 758”
 - II. Installation Instructions for DRÄGER high altitude diluter demand oxygen system and Maintenance and Operating Proposals, 2nd Edition, June 1978
10. VHF Transceivers, maintenance instructions for models shown in the Maintenance Manual

Available Documents cont'd:

11. For other equipment, refer to the instructions issued by the manufacturer

NOTES

- NOTE 1. Current weight and balance data including 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 and maintenance manuals must be displayed per the maintenance manual requirements.
- NOTE 3. Airworthiness Limitations are specified in the Limitation section of the Flight Manual, are FAA-approved, and may not be changed without FAA approval.
- NOTE 4. Operating the Discus-2cT with its power plant temporarily removed or inoperative is permissible in accordance with the directions stated in the Flight Manual.
- NOTE 5. Major structural repairs must be accomplished at FAA certificated repair stations rated for composite aircraft structure work on small aircraft, and in accordance with Schempp-Hirth Flugzeugbau GmbH repair methods, which are approved by FAA.
- NOTE 6. All external portions of the glider exposed to sunlight must be painted white except the areas for markings and registration.
- NOTE 7. Approved maneuvers are listed in the Flight Manual and must be followed for safe operation.
- NOTE 8. Cloud flying is permissible in the U.S. provided the pilot has the appropriate rating per FAR 61.3, the glider contains the necessary equipment specified under FAR 91.205, the pilot complies with IFR and oxygen use requirements, and the pilot follows instructions given in the Flight Manual.

...END...